HEALTH DISPARITIES AND ATTENTION TO HEALTH INFORMATION BY DISENFRANCHISED GROUPS

BY

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DISSERTATION

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Abstract

Disparities in health outcomes may be explained in part by differences in attention to health information across groups. A series of six studies examined the impression, defense, and fear-reduction motives underlying attention to health information by individuals from traditionally disenfranchised groups. Results suggested that both chronic and situational factors influence activation of impression motives, which in turn produce shame and avoidance of information about stigmatized health issues.

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Table of Contents

Chapter 1: Introduction

Disenfranchised groups often bear the brunt of disease burden (National Association of Chronic Disease, 2010). For instance, African-Americans relative to European-Americans carry a disproportionate weight of a wide variety of conditions including heart disease, hypertension, cancer, diabetes, stroke, and Human Immunodeficiency Virus (HIV) (Centers for Disease Control and Prevention, 2005a). These disparities in health outcomes across groups may be triggered by myriad causes. For instance, African-Americans compared to European-Americans may have systemically less access to healthcare, incomplete or nonexistent insurance coverage, or may simply not receive necessary medical procedures (Agency for Healthcare Research and Quality, 2000; Center for Health Equity Research and Promotion, 2010). From a public health perspective, the existence of health disparities suggests that work is needed to ensure that *all* people receive needed medical care and prevention services.

Although past work has been done to address health disparities at a system level (Agency for Healthcare Research and Quality, 2000; Center for Health Equity Research and Promotion, 2010; Centers for Disease Control and Prevention, 2009), comparatively little has been done to examine how individual level factors may also perpetuate these gaps. For instance, members of disenfranchised groups may have more distrust of the health care system, or more negative norms about help seeking that inhibit seeking medical treatment or testing (Agency for Healthcare Research and Quality, 2000; Center for Health Equity Research and Promotion, 2010). In addition, health disparities may also be due in part to discomfort and unwillingness to approach health information by members of disenfranchised groups. Specifically, individuals from disenfranchised groups may be concerned that others will think that they are bad or immoral if they attend to information or that the information is inappropriate for a person like them. When a disease is highly prevalent in their groups, individuals may also conclude that the

information is threatening and withdraw attention as a way of managing disease anxiety. These expectations correspond to important social psychological motives that can be referred to as *defense, impression*, and *fear-reduction motives* respectively. This proposal aims to understand some of the determinants of low attention to health information by disenfranchised groups based on a theoretical framework that explicates anticipated beliefs and emotions that may reduce an audience's attention to health information.

The proposal is organized around a theoretical framework that is presented in Figure 1 and predicts when potential participants will pay attention to health information. For vulnerable populations such as members of disenfranchised groups, encountering information about a stigmatized health issue may be particularly threatening. In line with this framework, several factors may influence this greater threat among members of disenfranchised groups. For instance, activation of impression, defense, and fear-reduction motives may be greater in disenfranchised than privileged groups and thus lead to lesser attention to information about stigmatized health issues. These more active motives may be observed in specific beliefs (expectations about the consequences of attending to the information) and emotional responses that likely affect controlled and automatic aspects of attention (Ajzen & Fishbein, 1980, 2005; Albarracín, Johnson, Fishbein, & Muellerleie, 2001; Fishbein & Ajzen, 1975).

We predict that when impression motives are salient, information about stigmatized health issues (e.g., HIV) is expected to elicit less attention than comparable information in health domains that are perceived as less stigmatized (e.g., flu). The mediators of the hypothesized difference between membership in a disenfranchised group and attention to information about stigmatized health issues include stronger beliefs in the possibility of being negatively judged by others (stigma belief) and greater levels of the emotion of shame. Several factors are likely to influence impression motives, which may in turn reduce attention to information about

stigmatized health issues. For instance, people with past experiences of social rejection, such as members of traditionally disenfranchised groups including ethnic minorities, chronically anticipate stigma (Brooks, Etzel, Hinojos, Henry, & Perez, 2005) and may thus show reduced attention to information about stigmatized issues (Downey & Feldman, 1996; Feldman & Downey, 1994; Mendoza-Denton, Downey, Purdie, Davis & Pietrzak, 2002). Also, as the presence of others can heighten stigma anticipation (Dovidio, Major, & Crocker, 2000; Goffman, 1963), receiving information about stigmatized health issues in the presence of others may elicit less attention than receiving the same information when alone. If impression motives are driving low attention to health information, chronic impression motives (e.g., fear of interpersonal evaluation) or situational reminders of stigma (e.g., subliminal priming of stigma associated words) may also produce more shame in response to stigmatized health issues compared to control information.

As shown in Figure 1, however, there might also be other motives that simultaneously influence attention to information about stigmatized health issues. For instance, confronting information about HIV may lead people to think that they are "not the kind of person who needs information about HIV." This sort of reaction is more consistent with the motive to maintain a favorable self-image by defending the self-concept (a defense motive). Defense motive may also be implicated in health disparities because African-Americans compared to European-Americans score higher on trait measures of reactance, which can be linked to a desire to defend the self from impositions (Dillard & Shen, 2005). Finally, as HIV is a life-threatening condition, attention to HIV-relevant information may also create disease anxiety (e.g., "reading about HIV is scary"). Fear might be greater for African-Americans than European-Americans, in part because of the existence of disparities in disease prevalence and incidence. That is, African-Americans compared to European-Americans may be more likely to know that they are in an at-

risk group, and perhaps even know someone who is affected by health issues, thus feeling more personally susceptible when presented with information on the topic. As with impression motives, defense and fear-reduction motives may also be activated by factors of the person or the situation. Defense motives may be activated by a focus on the private aspects of oneself and fear-reduction motives may be activated by reminders of the severity or low treatability of a disease (see Figure 1).

This thesis is organized into three sections. In the first section, we establish that disparities in attention to health information across racial groups parallel disparities in behavioral health outcomes in a public health setting. Specifically, we address if African-Americans pay less attention to information about stigmatized health issues than European-Americans. In the second section of the thesis, we look exclusively at impression motives as a way of understanding one potentially prominent process underlying attention to information about stigmatized health issues. For instance, this section reviews factors that may influence activation of impression motives (e.g., the presence of others, priming of stigma, or chronic experience of stigma) as well as shame as the emotional consequence of impression motives. We also examined if the chronic and situational factors that influence impression motives interact to increase feelings of shame. This section, however, clearly conveys that other motives may also play a role in directing attention to information.

In the third section of this thesis, we examine the time-course of attention to information about stigmatized health issues. A critical question, as of yet unanswered, is whether information about stigmatized health issues initially attracts attention before defensive processing occurs (late disengagement), or if participants merely tune out information about stigmatized health issues altogether (early disengagement). Early versus late disengagement may produce similar behavioral results (i.e., low attention to information about stigmatized health issues) but has very

different implications for increasing attention to this information (i.e., attracting attention vs. reducing defensive processing). In addition, we attempt to disentangle the independent influences of impression, defense, and fear-reduction motives on attention to health information across groups. We predicted that information about stigmatized health issues such as HIV may activate impression, defense, and fear-reduction motives for members of disenfranchised groups.

The present paper outlines six studies to examine the roles of impression, defense, and fear-reduction motives as barriers to attention to information about stigmatized health issues. In the first section, we established the existence of disparities in attention to information about stigmatized health issues for African-Americans compared to European-Americans. Study 1 was a field study at the Champaign Urbana Public Health District that tested if attention to information about a stigmatized health issue (versus information about a control issue) is attenuated for members of traditionally disenfranchised groups.

The second series of studies aimed at examining impression motives, including the factors that activate impression motives and thus provoke shame. In addition, we predicted that impression motives are a key reason why members of traditionally disenfranchised groups avoid contact with information about a stigmatized health issue. Therefore, in Study 2, we examined if priming impression-relevant concepts increases shame about stigmatized health issues. In Study 3, we asked participants to report shame when confronting embarrassing situations while they perceived to be alone versus when they perceived that others were present. In Study 4, we wanted to test the interactive influences of chronic impression motives with environmental cues to impression motivation, in this case the perceived presence of others, to see if chronic factors interact with situational cues to intensify feelings of shame in response to information about stigmatized health issues.

The third series of studies were designed to examine the time-course of attention to

information about stigmatized health issues. Furthermore, we explored other factors beyond impression motives that may influence attention to health information. Specifically, we examined the processes underlying attention to health information, including the activation of impression, defense, and fear-reduction motives. Given that all motives should reduce attention to information about stigmatized health issues, we wanted to isolate the potential contribution of each motive. We used self-report of the motives while also assessing participants' psychophysiological responses with Event Related Potentials (ERP). This measure is non-invasive but can give additional insight into participants' cognitive and emotional responses to information. Participants also responded to a series of questions about the information to measure beliefs about and emotional response to the information.

Chapter 2: Antecedents and Consequences of Attention to Health Information by Disenfranchised Groups

In this chapter, we review relevant literature on health disparities, as well as the link between disparities in attention to health information and behavioral outcomes. Furthermore, we examine in more detail each of the motives we are interested in investigating (impression, defense, and fear-reduction). Finally, we describe a framework that predicts how beliefs and emotions mediate the influence of the impression, defense, and fear-reduction motives on attention to information about health issues and introduce six studies designed to test these pathways.

Social Health Disparities

According to the National Association of Chronic Disease, health disparities are differences in the incidence, prevalence, mortality, burden of disease, and other adverse health conditions or outcomes that exist among specific population groups in the United States (2010). These population groups can be based on gender, age, ethnicity, socioeconomic status, geography, sexual orientation, disability, or special health care needs. In the United States, the problem of health disparities is particularly salient across racial groups. For instance, Puerto Ricans suffer disproportionately from asthma, HIV/AIDS, and infant mortality (Centers for Disease Control and Prevention, 2005b), Mexican-Americans suffer disproportionately from diabetes (Centers for Disease Control and Prevention, 2005b), and African-Americans relative to European-Americans suffer disproportionately from stroke, hypertension, cardiovascular disease, diabetes, hepatitis, cancer, tuberculosis, mental disorders, syphilis, and HIV (Centers for Disease Control and Prevention, 2005a). The list goes on and on and suggests that racial or ethnic minorities, particularly African-Americans and Latinos, bear a disproportionate burden of a wide variety of diseases.

Of the many conditions for which health disparities exist, Human Immunodeficiency Virus is one of the worst pandemics of the last twenty years (Centers for Disease Control and Prevention, 2006). Over 30 million people are infected worldwide (UNAIDS, 2010). The human costs of HIV are extraordinary, including an entire generation of over 16 million children who have been orphaned by HIV (UNAIDS, 2012). In some countries, such as Zimbabwe and Botswana, up to 75% of all orphans are children of HIV victims (UNICEF, 2006). The economic costs of HIV are also debilitating, with decreases in Gross Domestic Product (GDP) up to 1.5% annually for countries with high infection rates (Bell, Devarajan, & Gersbach, 2003). Finally, HIV is not just a problem abroad as over a million of US Americans are believed to be HIV-positive (Centers for Disease Control and Prevention, 2012a). African-Americans make up roughly 13% of the US population, yet they account for approximately 60% of all HIV cases in the US. Clearly HIV infection, especially for African-Americans, is an issue that must be addressed.

Disparities in Attention to Information as a Predictor of Health Outcomes

One possible explanation for differences in health outcomes across groups is differences in attention to health information that parallel behavioral outcomes. In particular, recent meta-analytic evidence suggests that African-Americans are less likely to complete preventive interventions than members of other ethnic groups (Albarracin & Durantini, 2010). Specifically, samples with higher proportions of African-Americans complete interventions less than samples with lower proportions of African-Americans (Albarracin & Durantini, 2010). However, studies with higher proportions of African-Americans show higher levels of behavior change than studies with lower proportions of African-Americans (Albarracin & Durantini, 2010). This discrepancy between intervention exposure and behavior change thus suggests that ensuring reception to health messages may effectively reduce HIV risk among African-Americans.

Message reception by target audiences may be difficult because people can selectively attend to the information. For instance, no matter how many times an intervention program is offered or prevention messages are played in the waiting room of a health clinic, clients can always tune out the message. According to Festinger (1957, 1964) and others (Brock & Balloun, 1967; Fischer, Jonas, Frey, & Schulz-Hardt, 2004; Frey, 1986; Hart, Albarracin, Eagly, Merrill, & Lee, 2009), people prefer information that supports what they are currently doing and shun information that contradicts their practices. This effect has been demonstrated across a wide variety of domains and falls under the umbrella of *selective attention* (Brock & Balloun, 1967; Canon & Matthews, 1972; Festinger, 1957, 1964; Frey, 1986; Hart et al., 2009). For instance, in the area of mass communication, prejudiced people are less likely to attend to anti-prejudice propaganda than non-prejudiced people (Cooper & Jahoda, 1947). In the domain of health and body image, women with lower appearance anxiety are more likely to view media that sexually objectifies women than women with higher appearance anxiety (Aubrey, 2006). In the area of alcohol drinking, heavy alcohol drinkers tend to watch more advertisements for alcohol than do light drinkers and nondrinkers (Perrissol, Boscher, Cercle, & Somat, 2005). In the area of HIV-prevention, participants with higher motivation to use condoms, stronger condom use behavioral skills, and more frequent past condom use are more likely to accept an HIV-prevention counseling session than participants with lower motivation to use condoms, weaker condom use behavioral skills, and less frequent past condom use (Earl, Albarracin, Durantini, Gunnoe, Leeper, & Levitt, 2009).

Several models have been proposed to conceptualize the process going from information reception to behavior change (Albarracin, 2002; Chaiken, 1980; Fazio, 1990; Hovland, Janis, & Kelley, 1953; Greenwald, 1968; McGuire, 1968, 1972; Petty & Cacioppo, 1986). In particular, McGuire's (1968) reception-yielding model suggests that receiving a message can be separated

into three discrete steps: exposure, attention, and comprehension. In this model, exposure involves initial presentation of a persuasive message, attention concerns whether or not participants choose to attend to the information, and comprehension entails whether or not participants understood the persuasive message. In the case of health information, it is rarely the case that people have not been in places where at least some information was presented. On the contrary, prior work suggests that people often feel inundated with informational overload (Bargh & Thein, 1985; Edmunds & Morris, 2000; Gross, 1964), particularly in a health context (Cline & Haynes, 2001; Hall & Walton, 2004). Furthermore, health clinics and hospitals frequently play educational videos in their waiting rooms to give clients additional exposure to messages, and high school students are often required to go through health classes that feature HIV-prevention education (Centers for Disease Control and Prevention, 2012b). However, presentation of the information does not necessarily ensure that participants will pay attention to the messages. As such, in this thesis we examine attention to health information as a critical determinant of subsequent behavior change.

Theoretical Framework

There are several factors that are likely to influence attention to information. For instance, individuals may be motivated by the impression that attending to health information might make on others (impression motives; Hart et al., 2009; Schlenker, 1980), by their motives to defend current attitudes or behaviors (defense motives; Chaiken, Liberman, & Eagly, 1989; Kunda, 1990), or by their desire to avoid fear of a given disease (fear-reduction motives; Janz & Becker, 1984; Fisher & Fisher, 1992; 2000; Floyd, Prentice-Dunn, & Rogers, 2000; Rogers, 1975; Rosenstock, 1974; Rosenstock, Strecher, & Becker, 1994). All of the three motives should reduce attention to threatening information but the mediating mechanisms could be motive specific (Chaiken et al., 1989; Kunda, 1990; Schlenker, 1980). Although all of these motives

should presumably reduce attention health information, they are apparent in a different set of expectations and emotions in response to the information. For instance, impression motives may activate beliefs about social stigma, as well as shame. Defense motives may activate beliefs about the irrelevance of information for the self, as well as anger. Finally, fear-reduction motives may activate beliefs about diseases susceptibility, as well as fear. Clearly delineating reasons why members of disenfranchised groups do not attend to information about stigmatized health issues is critical to subsequently increase attention to needed information.

The Impression Motive and Experience of Shame

The decision to attend to health information may be based, in part, on the impression that seeking this information might make on others. According to impression management theory, people are often motivated to control the perceptions others have of them (Schlenker, 1980) and focus on the interpersonal outcomes of a given behavior (Chaiken, Giner-Sorolla, & Chen, 1996). As a result, they are aware of the views of others and take those views into account before they act (Chaiken et al., 1996; Schlenker, 1980). There are likely several factors that trigger impression motives. For instance, chronic sensitivity to rejection entails heightened awareness of others and their evaluations of one's behavior (Downey & Feldman, 1996). Similarly, the presence of others may also influence the activation of impression motives by heightening norms about how to behave (Ajzen & Fishbein, 2005; Fishbein & Ajzen, 1975; Goffman, 1963; Shah, 2003).

Impression motives may be particularly salient for HIV prevention, in part because HIV has long been linked to morally sanctioned behaviors and groups rejected by the mainstream (Centers for Disease Control and Prevention, 2005; Herek, 1997, 1999; NIMH Research Workshop on AIDS and Stigma, 1998). A social stigma is defined as severe social disapproval of personal characteristics or beliefs that are perceived to conflict with cultural norms (i.e., "the

situation of the individual who is disqualified from full social acceptance;" Goffman, 1963, p. 9). Approach to HIV-relevant information may be curtailed for people who think that approaching this information will imply a linkage to HIV and belonging to disenfranchised groups associated with this infection (e.g., drug users or gay men; Herek & Glunt, 1988). In fact, participants of focus groups have reported that they are unwilling to approach HIV-relevant information due to the potential for others to judge them negatively as a result (Albarracin, Durantini, & Earl, 2006). Specifically, focus group participants reported that even reading an HIV-prevention brochure while in a waiting room could imply that they themselves were HIV-positive. As a result, encountering HIV-relevant information may itself activate an impression motive, reflected in beliefs that attending to the information will result in negative social judgments. Consequently, participants may cope with the anticipated stigma of attending to HIV-relevant information by withdrawing attention from this information.

Another consequence of impression motives is the emotional experience of shame. Shame is the "aversive feeling when we sin, transgress, or err" (Tangney, Stuewig, & Mashek, 2007, p. 347), is often a consequence of a norm violation (Clore, Schwarz, & Conway, 1994), and can often follow stigmatizing experiences (Allport, 1954; Pineles, Street, & Koenen, 2006; Schmader & Lickel, 2004). People with a chronic history of stigmatization are more likely to experience shame (Buss, 1980; Downey & Feldman, 1996; Fossum & Mason, 1986; Mendoza-Denton et al., 2002), and shame can be triggered not only by the real presence of others but also by the imagined presence of others (Dovidio et al., 2000; Goffman, 1963; Shah, 2003). In this sense, impression motives (e.g., chronic rejection sensitivity, the presence of others, etc.) might also trigger shame in addition to activating beliefs about a negative social judgment.

Shame is primarily an avoidance emotion, which means that when people experience shame they are more likely to disengage from situations that trigger shame (Clore et al., 1994; Frijda,

Kuipers, & ter Schure, 1989). Thus, when impression motives are activated, people who experience shame should be more likely to avoid the information than those who do not experience shame. As both beliefs about stigma and shame are responses to perceived social sanctions (Clore et al., 1994; Dovidio et al., 2000; Goffman, 1963), the presence of others may also amplify shame (Smith, Webster, Parrott, & Eyre, 2002). As a result, potential participants may be less likely to attend to information about stigmatized health issues when others are present as a way of avoiding shame associated with impression motives. In the second series of studies reported in this thesis, we examined the antecedents and the consequences of the impression motive. Specifically, we considered if history of negative social evaluation, the presence of others, or priming impression-relevant concepts increase shame and decrease attention in response to information about stigmatized versus control issues.

Defense and Fear-Reduction Motives as Predictors of Attention to Health Information

Although we predict that impression motives can reduce attention to health information, other factors can exert similar effects. For instance, attention to information may be motivated by the desire to defend current practices from perceived attack (Albarracin, Durantini, Earl, Gunnoe, & Leeper, 2008; Noguchi, Albarracin, Durantini, & Glasman, 2007). In this respect, the defense motive emerges from a focus on personal values (Chaiken et al., 1996), such that the potential contradiction of cherished values or practices triggers avoidance of the information (Albarracin & Mitchell, 2004; Festinger, 1957, 1964; Frey, 1986). The focus on internal evaluations triggered by defense motives is in direct contrast to the focus on external evaluations triggered by impression motives. There are several factors that may spark the defense motive and subsequent avoidance of information. For instance, dispositional perceptions of one's inability to defend oneself may promote avoidance of threatening information (Albarracin & Mitchell, 2004;

Albarracin et al., 2008), and increasing one's perceived ability to defend cherished beliefs may facilitate approach to attitude-inconsistent information (Albarracin & Mitchell, 2004; Albarracin et al., 2008). A second factor that may influence avoidance of threatening information is commitment to the beliefs or behaviors in question. For instance, participants avoid threatening information but only for those beliefs that are strongly held and thus represent a threat (Brehm & Cohen, 1962). More generally, receiving a threat to the self immediately prior to exposure to either supporting or threatening information increases avoidance of threatening information (Frey, 1986), as does receiving a threat after recently reporting a position or belief (Beauvois & Joule, 1996; Festinger, 1964). Similarly, making participants self-aware may produce avoidance of threatening information, presumably because a heightened awareness of one's own beliefs should lead to unwillingness to be inconsistent, even to the self (Diener & Srull, 1979). In the case of HIV prevention, heightened self-awareness may trigger beliefs that the threatening health messages (i.e., messages that contradict one's self-views) are irrelevant and thus not deserving of attention.

Disenfranchised groups in particular may view health information as threatening, and subsequently avoid the information as a way of dealing with the threat. According to reactance theory, acceptance of information is unlikely when people feel that the information threatens their freedom to do what they want (Brehm, 1966, 1972; Silvia, 2006). Instead, if people feel that their personal values are being threatened, they experience unpleasant arousal called reactance, which has both cognitive and affective components and has been linked to the emotional experience of anger (Dillard & Shen, 2005). Disenfranchised groups are by definition powerless, thus a threat to their already limited autonomy may produce avoidance of threatening information. In particular, African-Americans compared to European-Americans score higher on trait measures of reactance in the context of mental health counseling (Seemann, Buboltz,

Jenkins, Soper, & Woller, 2004), which suggests that African-Americans compared to European-Americans may be more sensitive to these threats. Furthermore, there are also group-level differences in distrust of the medical care system in general, such that African-Americans are more likely to report feeling distrustful of the intentions of the medical establishment (Kennedy, Mathis, & Woods, 2007). In this case, any information transmitted from a health care facility may be filtered through a lens of incredulity for African-Americans but not for European-Americans. However, people who expect that information will not force a point of view, or that they can successfully defend cherished attitudes and practices may be more likely to accept information about HIV-prevention (Albarracin et al., 2008; Albarracin, Leeper, Earl, & Durantini, 2008; Noguchi et al., 2007). The fact that decreased threat increases approach to information suggests that defense motives may be particularly relevant to examine.

A third motive possibly involved in attention to health information concerns the need to reduce anxiety about the physical consequences of contracting a disease (fear-reduction motive). Fear is generally conceptualized as an avoidance emotion (Clore et al., 1994), linked to sympathetic nervous systems activation that in turn promotes a "fight-or-flight" response (James, 1884; Lange, 1887; Lazarus, 1991). Several theoretical models have postulated various relations between fear and behavior change (Janz & Becker, 1984; Fisher & Fisher, 1992; 2000; Floyd et al., 2000; Rogers, 1975; Rosenstock, 1974; Rosenstock et al., 1994), and many studies have examined the role of fear of HIV infection in behavioral interventions (Belcher et al., 1998; Carey et al., 1997, 2000; St. Lawrence, Brasfield, Jefferson, Alleyne, & O'Bannon, 1995). Meta-analytic evidence suggests that HIV prevention interventions containing fear-inducing information decrease learning about HIV and actual behavior change (Earl & Albarracin, 2007). These findings suggest that fear may reduce attention to health messages.

African-Americans compared to European-Americans may have good reason to experience increased fear-reducing motives. African-Americans compared to European-Americans are more likely to suffer from and die from a variety of conditions (Centers for Disease Control and Prevention, 2005a), and this increased susceptibility and mortality may in turn increase the perception that the disease is scary. Furthermore, as mortality is higher for African-Americans compared to European-Americans, African-Americans may be more likely to know someone who has been directly affected by HIV or cancer. As a consequence of increased perceived susceptibility, African-Americans compared to European-Americans may be less likely to pay attention to health information that is perceived as scary. Furthermore, past work suggests that information that is perceived as being scary may be effective at changing behavior but only if people feel capable of enacting change (Leventhal, 1970). If people do not feel like they have the power to change their behavior, they cope by avoiding the message (Leventhal, 1970). As disenfranchised groups are often powerless, being confronted with scary health information may activate fear-reduction motives that in turn decrease attention to the information.

Examining the Independent Influences of Impression, Defense, and Fear-Reduction Motives

As explained in the previous sections, traditionally disenfranchised groups may show less attention to threatening health information due to the activation of the impression, defense, or fear-reduction motives. From a psychological perspective, however, each motive has a unique profile of moderating conditions as well as associated beliefs. For instance, some dispositional (e.g., public/private self-consciousness) or situational (e.g., highlighting the objective/subjective self-awareness) factors may determine whether the impression or defense motive come into play. As another example, fear-reduction motives may be accompanied by beliefs in disease susceptibility whereas the other motives may be accompanied with expectations of others'

judgments or specific beliefs about the self.

Dispositional and situational determinants of public versus private self-consciousness may influence impression (public self-consciousness) or defense (private self-consciousness) motives. In particular, people with high public self-consciousness are extremely attuned to the evaluations of others, including viewing the self as a social object, being attentive to how others perceive one's actions and attitudes, and also caring about the evaluations made about the self by others (Buss & Scheier, 1976; Carver & Scheier, 1978, 1981; Doherty & Schlenker, 1991; Feningstein, Scheier, & Buss, 1975; Fenigstein, 1979; Schlenker, Weigold, & Doherty, 1991). In contrast, people with high dispositional private self-consciousness are cognizant of their own thoughts, feelings, and motives (Buss & Scheier, 1976; Carver & Scheier, 1978, 1981). Moreover, the presence of others (Dovidio et al., 2000; Goffman, 1963) as well as priming impression-related concepts (Bargh, Chen, & Burrows, 1996) may trigger impression motives, whereas making participants more self-aware by using a mirror (Carver & Scheier, 1978) or having them report important self-beliefs (Beavois & Joule, 1996; Festinger, 1964) may trigger defense motives. Dispositional and situational factors may also influence fear–reduction motives. For instance, people who score highly on the Fear Survey Schedule (Bernstein & Allen, 1969) report feeling fear in response to a variety of objects and scenarios. Similarly, people who score highly on the trait anxiety scale (Spielberger, 1983) report feeling diverse forms of anxiety, including fear. Further, being in a health care facility or viewing information about life-threatening conditions may trigger disease anxiety and subsequent fear motivation (Janz & Becker, 1984; Rosenstock, 1974; Rosenstock et al., 1994).

Thus, differences in health outcomes for African-Americans compared to European-Americans may be explained in part by differences in attention health information. Attention, in turn, may be explained in part by differences in the relative activation of impression, defense,

and fear-reduction motives for African-Americans compared to European-Americans. We predict that the behavioral effects of attention as a function of activation of these motives is mediated by eliciting specific beliefs and unique emotional responses. In particular, we predict that impression motives should activate beliefs that interacting with threatening health information will damage one's reputation or result in negative social evaluation, as well as elicit the experience of shame. Furthermore, we predict that defense motives should activate beliefs that interacting with threatening health information will challenge important self-beliefs or that the information is simply irrelevant for oneself, while also eliciting the experience of anger. Finally, we predict that fear-reduction motives will activate beliefs that interacting with threatening health information will increase susceptibility awareness, as well as fear.

Predicting the Time-Course of Attention to Health Information

Even if social health disparities are paralleled by disparities in attention to information about stigmatized health issues, the issue of when disengagement from the message occurs still remains. One possibility is that members of disenfranchised groups merely tune out information about stigmatizing health information altogether. In contrast, members of disenfranchised groups may initially attend to information about stigmatizing health information before subsequently disengaging from the message. These two positions correspond to the notion of early versus late disengagement of attention.

Models of attention frequently differentiate information processing as a function of amount of attentional resources allocated to a particular stimulus. For instance, Broadbent's (1958) filter theory of early selection posited that sensory stimuli were selectively filtered, with attended stimuli being further processed and unattended stimuli being summarily ignored. In contrast, Deutsch and Deutsch (1963) posited a late disengagement model in which all stimuli are initially processed, at least until an object is identified, at which point selective processing occurs. Work

by Posner and Peterson (1990) integrated these two seeming disparate viewpoints by suggesting that three attentional systems of alerting, orienting, and executive control may operate independently. In particular, alerting is related to achieving and maintaining a state of alertness, orienting refers to selection of information from sensory input, and executive control is defined as resolving conflict among responses (Posner & Peterson, 1990).

In the context of early versus late disengagement, the critical test of whether or not early disengagement occurs is the presence or absence of an alerting response. One way of assessing the presence of early attention is to measure early-onset sensory-based Event Related Potentials such as the N100, which shows increased amplitude in response to attended (versus unattended) stimuli (Hillyard, Mangun, Woldorff, & Luck, 1995), and support early-selection theories of attention (Coull, 1998; Mangun & Hillyard, 1995; Pashler, 1998). N100 is an early-onset (peaking approximately 80-110ms post-stimulus presentation), negative-going potential that has a frontal distribution and has been linked to orienting and automatic stimulus processing (Hillyard, Hink, Schwent, & Picton, 1973; Luck, 2005). In addition, the N100 is moderated by threat perceptions. For instance, higher N100 amplitudes are elicited in response to threat compared to control primes (Weinstein, 1995), angry compared to neutral faces (Felmingham, Bryant, & Gordon, 2003), and faces of outgroup compared to ingroup members (Ito & Urland, 2003, 2005; Kubota & Ito, 2007). Overall, increased N100 amplitude suggests increased early attention to threatening stimuli and supports the idea of late disengagement. In line with our theoretical framework, we predict higher threat, and as such higher N100 amplitude, for members of disenfranchised groups in response to information about stigmatized health issues.

If information about stigmatized health information elicits an alerting response (as indexed by increased N100 amplitude) for members of disenfranchised groups, it is still possible that disengagement from information may occur at later stages of processing. For instance, members

of disenfranchised groups may cope with the threat of information about stigmatized health issues by allocating less attention at the stage of executive control. Executive control can be assessed via the P300 Event-Related Potential. P300 is a later-onset (peaking approximately 350-650ms post-stimulus presentation), positive-going potential that has a central-parietal distribution and has been linked to context updating and controlled processing of information (Hillyard et al., 1973; Luck, 2005). As a result, P300 is often used as an index of controlled attention allocation (Coull, 1998; Hillyard et al., 1995; Ruiter, Kessels, Jansma, & Brug, 2006). Decreased P300 amplitude in response to information about stigmatized health issues by members of disenfranchised groups would support the notion that members of disenfranchised groups are initially alerted to information about stigmatized health issues but may cope with the increased threat associated with the information by disengaging attention. Decreased P300, and corresponding decreased executive attention, may also be apparent in observational measures of attention, such as unobtrusive observation used in Study 1.

Measures of Attention

One key aim of this thesis is to examine attention to information about stigmatized health issues. Across several studies, our measures of attention vary in an attempt to attack a very large and complex problem from multiple angles. In Study 1 we use unobtrusive observation to measure overt attention to a health video in the waiting room of a health clinic. This approach has several distinct advantages. First, unobtrusive observation allows us to examine exposure to materials and programs while minimizing the effects of social desirability on the choice to accept these offers (Webb, Campbell, Schwartz, & Sechrest, 1966). Second, unobtrusive observation allows us to have an accurate, objective measure of exposure free of motivational biases in reporting (Webb, et al., 1966). This measure has very high external validity (i.e., we measure what participants are doing in vivo in a location where intervention programs are often delivered

to target audiences). However, this approach does have the drawback that observation only captures overt, but not covert, attention to a health message. As such, demonstrating that participants do not overtly attend to information in a waiting room (e.g., observable behavior such as looking at a video) does not rule out the possibility that participants are covertly attending to information (e.g., listening to a video without directly looking at it).

In contrast, Studies 5 and 6 were designed to examine the cognitive processes underlying attention in a more precise though artificial way. Specifically, participants completed a flanker task of attention either in a conference room of a public health clinic (Study 5) or while attached to an Electroencephalogram to measure Event Related Potentials (ERPs) in a university lab (Study 6). In our studies, we used a modified version of a flanker task that instructed participants to respond to a target arrow while the target arrow is "flanked" with either arrows pointing the same direction (i.e., congruent trials; <<< or >>>) or the opposite direction (i.e., incongruent trials; <>< or ><>). In addition, the flanker trials presented in the study were also flanked by words related to the categories of interest. Namely, we were interested in examining the influence of a stigmatizing health condition (HIV) a control health condition (FLU), and a non-health control condition (BOX) on reaction to the flanker trials. Decrements in performance (i.e., longer response latencies) correspond to attention capture by the words in the categories of interest. Thus, attention to words in the categories of interest can be indexed by the amount of time participants take to respond to the flanker task trial. In addition, because the flanker task is a measure of response conflict, if conflict does occur (i.e., the words are capturing attention), the conflict effects should be particularly salient for the incompatible compared to compatible trials (Eriksen, 1995). In the incompatible compared to compatible trials, participants have to deal not only with response conflict with the word, but also with arrows in opposing directions to the target arrow. Furthermore, attention capture should result in increased amplitude of both the

N100 and P300 ERP components.

Finally, although Studies 2 through 4 do not measure attention directly, these studies do examine factors that, in line with the theoretical framework, should influence attention to information about stigmatized health issues. Exploring these mechanisms gives additional insight into the path from initial exposure to information about stigmatized health issues to disengagement from these materials. Taken together, these three disparate approaches were used to examine the complex issues of attention to information about stigmatized health issues by members of disenfranchised groups. We hope that the integration of these approaches can be used to have a more cohesive understanding by approaching the topic from many sides.

Overview of Studies

One explanation for the existence of health disparities across racial groups is that members of disenfranchised groups may pay less attention to information about stigmatized health issues. In the first section of this thesis, we aimed to test this hypothesis by unobtrusively observing clients in the waiting room of the Champaign-Urbana Public Heath District. Specifically, in Study 1, we determined if African-Americans actually pay less attention to information about HIV than European-Americans while in the waiting room of a health clinic.

We have theoretical hypotheses about why individuals from disenfranchised groups attend to information about stigmatized health conditions to a lesser extent than other groups. For instance, members of disenfranchised groups may be motivated by the impression their attention to information may make on others. In addition, members of disenfranchised groups may be motivated to defend their current attitudes and behaviors, or may simply experience heightened levels of fear that trigger avoidance. In the second series of studies, we investigated the antecedents and consequences of these motives with particular attention to the impression motive. In Study 2, we examined if subliminally priming impression-relevant concepts produces

effects similar to those of membership in a disenfranchised group. In Study 3, we investigated if the perceived presence of others influences shame in response to stigmatizing health information. In Study 4 we tested if these effects are working independently or if chronic awareness of impression motives and presence of others interact to produce higher rates of shame.

We were also interested in examining when decrements in attention are first observed. In Studies 5 and 6, participants read information about a variety of issues (e.g., a stigmatized health issue [HIV], a control health issue [FLU], and a non-health control issue [BOX]) and then completed a modified flanker task. In Study 6, we used Event-Related Potentials to examine attention as well as self-report to assess the beliefs and emotions predicted to mediate the relations between motives and attention to information. In this fashion, we attempted to examine the mediating mechanisms underlying attention to health information as a way of more completely understanding the processes driving attention. Attention was assessed by performance on the flanker task as well as measuring how long participants spent viewing information about each of the health issues in both studies 5 and 6. In addition, in Study 6, degree of attention was also assessed by examining the amplitude of the N100 and P300 potentials across information type. Differentiation between impression, defense, and fear-reduction motives was accomplished by self-report.

Chapter 3: Differences in Attention Across Groups

In this chapter, we address differences in attention to information about stigmatized health issues across racial groups. In particular, we were interested in examining if there were observed differences in attention to information about a stigmatized health issue for African-Americans compared to European-Americans. In Study 1, we used unobtrusive observation to measure if there were group-level differences in attention to information about a stigmatized health issue (HIV) for African-Americans compared to European-Americans in the waiting room of a public health facility.

Study 1: Unobtrusive Observation of Attention to a Video About a Stigmatized/Control Health Issue

Overview

In Study 1, we wanted to examine what participants were actually doing while in the waiting room with the opportunity to watch a health promotion video. Specifically, we wanted to investigate if African-Americans attended to information about a stigmatized health issue less than European-Americans. In this case, participants were unobtrusively observed while in the waiting room of the Champaign-Urbana Public Health District. Participants were randomly assigned by a day and time schedule to watch either a video about a stigmatized health issue (HIV) or a control health issue (flu).

Method

Participants and Design

Participants were eighty-seven clients of the Champaign-Urbana (Illinois) Public Health District. Participants were of both genders (45 men, 42 women) and ethnically diverse (34

Blacks, 38 Whites, 15 "Other"). The design of the study was a 2 (Disenfranchised Group: Blacks vs. Whites) X 2 (Information type: Stigmatized vs. Control). This study used unobtrusive observation to measure attention to the video.

Procedure

Participants were unobtrusively observed while they visited the Adult Sexual Health Clinic of the Champaign-Urbana Public Health District. During this time, participants either had the opportunity to watch a video about a stigmatized health issue (HIV) or a control health topic (flu). Participants were observed for the entire duration of their time in the waiting room. Coders recorded the amount of attention participants paid to the video, as well as participants' demographic variables, including observed race, and features of the visit, including how alert participants seemed and the duration of their time in the waiting room.

Videos

Stigmatized Health Issue Video. The video about a stigmatized health issue (HIV-prevention), "Safe in the City," is a vignette-based video in soap-opera style about HIV- and STI-prevention. The video features three story lines related to condom use. In the first segment, Paul and Jasmine are a monogamous couple who are contemplating quitting condom use until Paul cheats and contracts a Sexually Transmitted Infection. In the second, Teresa and Luis hunt for a condom before beginning a casual fling. In the third, Christina and Reuben deal with the fall-out of a casual sex encounter that Reuben has with another man, Tim. In all three vignettes, the characters discuss the barriers to using a condom, as well as the consequences of unprotected sex. The video also features "commercial breaks" between the vignettes that focus on specific

condom-use skills such as selecting a condom and condom application. The video was approximately twenty minutes long and ran on a continuous loop in the waiting room.

Control Health Issue Video. The control (flu-prevention) video was a video called "GermBusters." The video discussed prevention, symptomology, and treatment of flu, including H1N1. The video was approximately twenty minutes long and ran on a continuous loop in the waiting room.

Unobtrusive Observation and Behavioral Coding

Behavioral coding was done by two highly trained senior research assistants and a graduate student. Training included a detailed description of the coding sheet and study objectives without discussing the specific hypotheses of the study, in addition to analyzing a training video and coding until achieving reliability. Once coders were in agreement ($\kappa > 0.80$), the study commenced. The coding sheet (Albarracin et al., 2008; Albarracin, Leeper, Earl, & Durantini, 2008; Bruder, Albarracin, & Earl, 2007; Earl et al., 2009) included a measure in which the client was rated as (a) ignoring the video (attention score of 0), (b) casually looking/glancing at the video (attention score of 1), and (c) paying attention to the video (attention score of 2). The coding sheet also included demographic information about the participants such as race and gender and features of the situation such as baseline level of alertness and duration in the clinic waiting room.

Results and Discussion

We wanted to test the hypothesis that Blacks relative to Whites would actually pay less attention to information about stigmatized health issues. In this case, we used Analysis of Variance with membership in a disenfranchised group (Blacks vs. Whites) and information type

(stigmatized vs. control) as two between-subjects factors, and baseline level of arousal and duration of time in the clinic waiting room as covariates, predicting attention to the video.[1] There was a significant two-way interaction between membership in a disenfranchised group and information type ($F_{1, 58} = 4.034$, $p = .049$). The means are presented in Figure 2. Furthermore, for Blacks but not Whites, attention differed by type of information. Blacks were significantly less likely to attend to stigmatized information compared to control information ($M_{\text{stigmatized}} = -0.788$, $SD_{\text{stigmatized}} = 1.008$; $M_{\text{control}} = 0.123$, $SD_{\text{control}} = 0.819$; $F_{1, 58} = 8.643$, $p = .027$). However, there was no difference in attention across type of information for Whites ($M_{\text{stigmatized}} = 0.133$, $SD_{\text{stigmatized}} = 1.167$; $M_{\text{control}} = 0.017$, $SD_{\text{control}} = 0.970$; $F_{1, 58} = 0.204$, $p = .653$). In addition, for stigmatized but not control information, attention differed by racial group. Blacks were significantly less likely than whites to attend to stigmatized information ($F_{1, 58} = 4.986$, $p = .015$). However, there was no difference in attention across race for control information ($F_{1, 58} = 0.327$, $p = .571$). There was no main effect of either membership in a disenfranchised group or information type. Overall, this study suggested that health disparities may be perpetuated, in part, by differences in attention to stigmatized versus control health information across Blacks and Whites.[2]

[1] Because we were interested in examining health disparities between Blacks and Whites, participants of other races were excluded from analyses (n=15). Furthermore, eight participants (four Blacks and four Whites) were excluded from analyses because no information about duration was reported. As such, the total sample included in analyses presented is n = 64 (30 Blacks and 34 Whites).

[2] As this was a purely observational study, there is no way to control for other group-level differences across race that may explain differences in attention. For instance, differences in attention may vary as a function of educational or reading level. However, the presence of a two-way interaction with information type suggests that, regardless of other group-level differences, African-Americans are responding differently to health videos about stigmatizing versus control health issues.

Chapter 4: The Impression Motive and the Experience of Shame

In the second series of studies, we were interested in understanding the processes underlying the avoidance effects demonstrated in the previous chapter. Specifically, we examined if impression motives and the experience of shame accounted for part of the reason why African-Americans were less likely than European-Americans to pay attention to information about a stigmatized health issue. We present three studies in this chapter to test the hypothesis that activation of the impression motive increased the experience of shame.

Study 2: Evaluation of Information Following Activation of Impression Motivation Through Priming

Overview

In Study 1, we established that Blacks relative to Whites were less likely to pay attention to an HIV-video compared to a flu video. However, there are a variety of reasons why group differences in attention to information about stigmatized health issues might exist. In Study 2, we wanted to observe if impression motives and shame might be partially at stake. In this case, participants were primarily European-Americans students in the University of Illinois Psychology Subject Pool who were primed with either impression-relevant or control related words and then asked to evaluate scenarios about a variety of stigmatized and control scenarios. We hypothesized that when impression motives were activated that students would report feeling more shame in response to the stigmatized scenarios but less shame in response to control scenarios.

Method

Participants and Design

Participants were eighty-seven Introductory Psychology students in the University of Illinois Psychology Subject Pool who received course credit in exchange for their participation. Participants were of both genders (33 men, 54 women) and ethnically diverse (16 African-Americans, 51 European-Americans, 6 Asian-Americans, 9 Latino-Americans, and 5 "Other"). The study design was a 2 (Prime: impression-relevant versus control) X 2 (Information type: stigmatized vs. control) within-subjects factorial.

Procedure

Participants were primed through sixty-four trials of subliminally presented words distributed into eight blocks. Words were presented for 25-milliseconds with a 100-millisecond inter-stimulus interval, with front (&&&&&&) and back masks (XXXXXX). The impression-relevant words were "stigma," "shame," "embarrass," "outcast" and the control words were "between," "doctor," "market," "yard". The order of the primes was counterbalanced across conditions. As there were no significant effects of order, analyses are presented collapsed across counter-balancing conditions.

Measures of Shame

After each priming task, participants were asked to evaluate four scenarios, two stigmatized and two control. The content of the scenarios were broad, including (a) reading stigmatized/control brochures in the student health center, (b) spitting out/enjoying food prepared

by a friend, (c) tripping in class/sitting quietly in class, and (d) running into a former romantic partner/friend. A sample scenario is described below:

> *While waiting for your appointment at McKinley Health Center, you decide to read some brochures. The first one says, "The Truth about Genital Herpes" ("Factors that Affect Blood Pressure"). As you look up, you recognize a classmate watching you.*

Participants' shame was measured by means of two items, "How ashamed would you feel?" and "How embarrassed would you feel?" Participants responded on a ten-point scale ranging from 1 *not at all* to 10 *extremely*. The two items correlated (r (87) = .952, $p < .001$), and were averaged as a measure of shame.

Results and Discussion

We wanted to test the hypothesis that participants would experience more shame when presented with stigmatized (versus control) information following an impression-relevant prime than a control prime. We used a Repeated-Measures Analysis of Variance with prime (impression-relevant vs. control) and information type (stigmatized vs. control) as two within-subjects factors predicting self-reported shame. In line with the theoretical framework, there was a significant two-way interaction between prime and information type ($F_{1, 86} = 28.349$, $p = .001$), which is presented in Figure 3. When presented with stigmatized information, participants were more likely to report shame following a impression-relevant prime in contrast to a control prime ($M_{\text{impression}} = 7.213$, $SD_{\text{impression}} = 0.242$, $M_{\text{control}} = 6.603$, $SD_{\text{control}} = 0.208$; $F_{1, 86} = 7.473$, $p = .008$). However, when presented with control information, participants were less likely to report shame following an impression-relevant prime in contrast to an impression-relevant prime

($M_{impression}$ = 1.957, $SD_{impression}$ = 0.167; $M_{control}$ = 3.000, $SD_{control}$ = 0.207; $F_{1, 86}$ = 28.388, p = .001).

Priming impression motives produces similar effects on information evaluation compared to membership in a disenfranchised group. For instance, in Study 1, Blacks avoided information about HIV but not information about the flu. This difference may be due in part to chronic impression motives activated by a history of discrimination. In this case, African-Americans relative to European-Americans would be very quick to assess the potential for stigma in any given circumstance. When impression motives are made salient, in this case by subliminally priming impression-relevant concepts, the pattern replicates: When participants are primed with impression-relevant relative to control, they rate stigmatized information but not control information as more shameful and embarrassing. This pattern appears even in a sample of primarily European-American college students and suggests that the activation of impression motives may be partially responsible for reduced attention to stigmatized information in disenfranchised groups.

Study 3: Evaluation of Information when Presented Alone or in the Perceived Presence of Others

Overview

In Study 2, we established that activating impression-relevant concepts through priming influenced emotional reactions to the information. This finding suggests that the activation of an impression motive makes people more ashamed of potentially stigmatized information. In Study 3, we wanted to test if other factors that may influence activation of impression motives would also influence the evaluation of stigmatized versus control information. In particular, we wanted to know if the perceived presence of others would trigger impression motives and subsequent

shame when participants were presented with stigmatized versus control information. In this case, participants were primarily European-Americans students in the University of Illinois Psychology Subject Pool who evaluated health brochures.

Method

Participants and Design

Participants were sixty-two Introductory Psychology students in the University of Illinois Psychology Subject Pool who received course credit in exchange for their participation. Participants were of both genders (29 men, 33 women) and ethnically diverse (4 African-Americans, 39 European-Americans, 10 Asian-Americans, 4 Latino-Americans, and 5 "Other"). The design was a 2 (Presence of others: Others versus Alone) X 2 (Information type: Stigmatized vs. Control) within-subjects factorial.

Procedures

Participants viewed brochure titles about both stigmatized and control health issues. Stigmatized health brochures (e.g., "The Reality of HIV") included titles on topics that were rated as being more stigmatized in a pre-test (Chlamydia, Genital Herpes, Genital Warts, Gonorrhea, Hemorrhoids, Hepatitis, HIV, Pubic Lice, Scabies). Control health brochures (e.g., "Fight the Flu") included titles on topics that were rated as being less stigmatized in a pre-test (Blood Pressure, Carpal Tunnel, Chicken Pox, Flu, Health Disease, Mononucleosis, Salmonella, Vitamin Deficiency, West Nile Virus).

Participants were asked to evaluate how ashamed they would feel if they had to read each brochure either alone or when others were present based on the brochure title. Shame when Alone was measured with three items, "How ashamed would you feel?" "How embarrassed

would you feel?" and "How stigmatized would you feel?" Participants responded on a ten-point scale ranging from 1 *not at all* to 10 *extremely*. The items were strongly intercorrelated (Cronbach's $\alpha = .862$) and were combined into a single index of Shame when Alone. Shame when Others Present was measured with three items, "How ashamed would you feel when others present?" "How embarrassed would you feel when others present?" and "How stigmatized would you feel when others present?" Participants responded on a ten-point scale ranging from 1 *not at all* to 10 *extremely*. The items were strongly intercorrelated (Cronbach's $\alpha = .869$) and were combined into a single index of Shame when Others Present.

Results and Discussion

We wanted to test the hypothesis that participants would experience more shame when presented with stigmatized (versus control) information when others were present than when alone. In this case, we used a Repeated-Measures Analysis of Variance with presence of others (others present vs. alone) and information type (stigmatized vs. control) as two within-subjects factors predicting self-reported shame. There was a significant two-way interaction between presence of others and information type ($F_{1, 61} = 61.743$, $p = .001$) that is plotted in Figure 4. Furthermore, when presented with stigmatized information, participants were more likely to report shame in the perceived presence of others than when alone ($M_{\text{others}} = 5.235$, $SD_{\text{others}} = 0.330$; $M_{\text{alone}} = 4.284$, $SD_{\text{alone}} = 0.282$; $F_{1, 61} = 44.369$, $p = .001$). However, when presented with control information, participants were less likely to report shame in the perceived presence of others than when alone ($M_{\text{others}} = 2.061$, $SD_{\text{others}} = 0.148$; $M_{\text{alone}} = 2.251$, $SD_{\text{alone}} = 0.143$; $F_{1, 61} = 7.284$, $p = .009$).

The perceived presence of others produces similar effects on information evaluation compared to both priming impression motives and membership in a disenfranchised group. This

finding suggests that situational cues can also trigger activation of impression motives and subsequent shame. However, we still do not know if chronic impression motives and situational cues to impression motives contribute unique variance to evaluations of shame. We wanted to test both of these factors in Study 4.

Study 4: Evaluation of Information when Presented Alone or in the Perceived Presence of Others for People High or Low in Chronic Impression Motivation

Overview

So far, we have examined both chronic impression motives (e.g., inferred from membership in a traditionally disenfranchised group) as well as environmental cues to impression motives (e.g., priming impression-relevant concepts as well as measuring differences in the perceived presence or absence of others). However, we have yet to determine if these effects are the same, or if chronic and situational cues contribute uniquely to emotional evaluations of stigmatized information. In Study 4, we were interested in investigating the hypothesis that chronic impression motives and situational cues for impression motives interact to influence ratings of shame following exposure to stigmatized information. In addition, unlike Study 2, in Study 4 we manipulated the presence or absence of others in scenarios that participants evaluated.

Method

Participants and Design

Participants were fifty-seven Introductory Psychology students in the University of Illinois Psychology Subject Pool who received course credit in exchange for their participation. Participants were of both genders (30 men, 27 women) and ethnically diverse (2 African-

Americans, 32 European-Americans, 12 Asian-Americans, 10 Latino-Americans, and 1 "Other"). The design was a 2 (Presence of others: Others versus Alone) X 2 (Information type: Stigmatized vs. Control) X Continuous (Chronic Impression Motives) repeated measures factorial. In this experiment, presence of others and information type were within-subjects factors and chronic impression motives was a between subjects factor.

Procedures and Measures

Participants were asked to evaluate eight scenarios varying on two dimensions: presence/absence of others and stigmatized/control situation. The content of the scenarios was broad, including (a) reading brochures in the student health center, (b) eating food (c) going to class, and (d) sitting in the library. A sample scenario is described below:

> *While waiting for your appointment at McKinley Health Center, you decide to read some brochures. The first one says, "The Truth about Genital Herpes" ("Factors that Affect Blood Pressure"). As you look up, you recognize a classmate watching you (realize you are alone).*

Chronic Impression Motives. Chronic impression motives were assessed with the Adult Rejection Sensitivity Questionnaire (RSQ) developed by Geraldine Downey and colleagues (Downey & Feldman, 1996). The scale contains eight scenarios and asks participants to rate (a) how concerned they would be over another's reaction and (b) how willing another would be to help them in a given situation. The concern measures are on a scale from 1 (*very unconcerned*) to 6 (*very concerned*). The willingness to help measures are on a scale from 1 (*very unlikely*) to 6 (*very likely*). The scenarios cover a variety of issues such as borrowing money for one's parents, having an important conversation with a friend, or discussing the issue of sexual protection with

one's significant other. For example, the issue of sexual protection reads: "You bring up the issue of sexual protection with your significant other and tell him/her how important you think it is." Participants then respond to two questions: "How concerned or anxious would you be over his/her reaction?" and "I would expect that he/she would willing to discuss our possible options without getting defensive."

Shame. Participants were asked to evaluate how ashamed they would feel in each of the scenarios, using the following three items: "How ashamed would you feel?", "How embarrassed would you feel?" and "How self-conscious would you feel?" Participants responded on a ten-point scale ranging from 1 *not at all* to 10 *extremely.* All three items were highly intercorrelated (Cronbach's $\alpha = .924$) and combined into a single index of Shame.

Results and Discussion

The purpose of Study 4 was to test the hypothesis that chronic awareness of impression motives (assessed via self-report on the Rejection Sensitivity Questionnaire) interacted with situational cues that may activate impression motives (the presence of others). We used a Repeated-Measures Analysis of Variance with presence of others (others present vs. alone) and information type (stigmatized vs. control) as two within-subjects factors and self-reported chronic impression motives (the RSQ measure) as a continuous between-subjects variable predicting self-reported shame. There was a significant two-way interaction between presence of others and information type that replicates the results from Study 3 ($F_{1, 55} = 79.602$, $p = .001$). When presented with stigmatized information, participants were more likely to report shame in the perceived presence of others in contrast to alone ($M_{\text{others}} = 7.159$, $SD_{\text{others}} = 0.241$; $M_{\text{alone}} = 4.474$, $SD_{\text{alone}} = 0.215$). However, when presented with control information, participants were less likely to report shame in the perceived presence of others in contrast to alone ($M_{\text{others}} =$

2.623, SD_{others} = 0.203; M_{alone} = 2.241, SD_{alone} = 0.198). The two-way interaction was qualified by a significant three-way interaction between type of information, presence of others, and chronic impression motives ($F_{1, 55}$ = 11.295, p = .001). The means corresponding to this analysis appears in Figure 6. In addition, the pattern is exacerbated for participants with chronic impression motives, suggesting chronic and situational cues to stigma activation can interact to produce the highest levels of shame in response to information about stigmatized health issues.

Thus far, we have examined both the antecedents and consequences of impression motives. In particular, we have established that both chronic impression motives and situational cues to impression motives can be implicated in the experience of shame following exposure to stigmatized versus control information. In addition, chronic and situational cues to impression motives can interact to produce a heightened experience of shame.

Chapter 5: Understanding Multiple Motives of Impression, Defense, and Fear Avoidance

In Chapter 3, we demonstrated that health disparities among members of disenfranchised groups are paralleled by gaps in attention to information about stigmatized health issues. In Chapter 4, we investigated impression motives as a potential mediator to explain the relation between membership in a disenfranchised group and differences in attention to information about stigmatized health issues. In Chapter 5, we attempted to understand the time-course of attention to information about stigmatized health issues, as well as the independent contributions of impression, defense, and fear-reduction motives on attention to information about health issues across African-Americans and European-Americans.

Study 5: Pilot Test of Flanker Attention Task

Overview

In Study 5, we wanted to pilot test the flanker attention task used for the Event-Related Potentials procedures used in Study 6. Participants read information about a stigmatizing health issue (HIV), a control health issue (flu), and a non-health related control issue (information about boxes) and then completed a modified Eriksen flanker task (Eriksen & Eriksen, 1974). Trials appeared on the screen to participants as a target arrow flanked by two flanker arrows (one on each side) and a word (e.g., congruent: HIV >>> HIV or incongruent: HIV <>< HIV. Information type (HIV, FLU, and BOX), trial type (congruent and incongruent), and direction of target arrow (left and right) were fully crossed within-subjects, yielding a total of twelve possible trial types. Because the flanker task is a measure of response conflict, we predicted that if words from the categories of interest (HIV, FLU, and BOX) are capturing attention, this effect will be particularly apparent in the incongruent compared to congruent trials. This prediction follows

from the structure of the task itself, which indexes conflict in attention between stimuli as a function of response time (Eriksen & Eriksen, 1974; Eriksen, 1995).

Method

Participants and Design

Participants were thirty clients of the Champaign-Urbana (Illinois) Public Health District, who were paid $10 for participating in the study. Participants were of both genders (16 men, 14 women) and ethnically diverse (16 Blacks, 14 Whites). The design of the study was a 2 (Disenfranchised Group: Blacks vs. Whites) X 3 (Information type: Stigmatized health vs. Control health vs. Non-health control) X 2 (Trial type: Congruent vs. Incongruent) with a 2-level counterbalancing condition (Target arrow direction: Right vs. Left). Disenfranchised Group Membership was a between-subjects factor, whereas Information type, Trial type, and Target arrow direction were all within-subjects factors. The study measured reaction time to a modified Eriksen flanker task (Eriksen & Eriksen, 1974) and duration of time spent reading the paragraphs.

Procedure

Participants first completed a practice block of trials to familiarize them with the task. However, to prevent habituation, practice trials were flanked with the words “DOG” or “CAT” rather than the categories of interest. Once participants felt comfortable with the task, the experiment began. Participants completed ten blocks. Each block consisted of one paragraph

about each of the information types (HIV, FLU, and BOX) followed by 36 trials of the flanker task (three of each trial type) per block (180 trials total; 15 of each trial type).[3]

Measures of Attention

Attention was measured in two ways. The primary measure of attention was assessed using reaction time to the flanker task. As a secondary measure of attention, we also computed the average amount of time spent reading the paragraphs about each of the target issues (HIV, FLU, and BOX).

Analytic Strategy

Reaction times on the flanker task were log transformed and trimmed to two and a half standard deviations above and below the mean, with inaccurate trials set as missing values. Subsequently, reaction times for each of the categories of interest were averaged (HIV congruent, HIV incongruent, FLU congruent, FLU incongruent, BOX congruent, BOX incongruent). Two participants (both Blacks) were excluded from the analyses because they failed to perform at above-chance levels on the flanker task. All analyses were subsequently performed on the remaining 28 participants (14 Blacks and 14 Whites), although the pattern of results is identical when the excluded participants are included.

Results and Discussion

We wanted to test the hypothesis that Blacks relative to Whites would pay less attention to information about stigmatizing health information compared to control health information or non-health control information. In this case, we used Repeated-Measures Analysis of Variance to

[3] The study originally had 10 blocks of trials (360 trials total; 30 of each trial type). However, the effect of information decayed as participants habituated to the task. As such, in this study, as well as the next, only analyses with the first five blocks of trials are presented.

predict both reaction time to the flanker task as well as amount of time spent reading the paragraphs on each topic.

Reaction Time to the Flanker Task

We were primarily interested in how the presence of words relevant to the categories of interest (HIV, FLU, and BOX) would influence performance on a modified Erikson flanker task. In the context of a modified flanker task, faster reaction times suggest less attention to the flankers (i.e., the flankers are less distracting to the focal task of responding to the target arrow). As such, based on our theoretical framework, we would predict fastest reaction times for members of disenfranchised groups in response to stigmatized health information trials compared to control health information trials or non-health control trials. This effect should be amplified for incongruent compared to congruent trials. We first checked to see if there were any effects across counterbalancing condition (Target arrow direction: Right vs. Left). However, there was no difference in the direction of the target arrow (left vs. right; F (1, 27) = 0.01, p = .94), so we collapsed across counterbalancing conditions. Next, we used Repeated Measures Analysis of Variance to test our main hypothesis that Blacks compared to Whites would be differentially affected by the presence of stigmatized health information flankers (HIV) compared to control health information flankers (FLU) or non-health control flankers (BOX). We used a Repeated-Measures Analysis of Variance with Information type (Stigmatized health vs. Control health vs. Non-health control) and Trial type (Congruent vs. Incongruent) as two within-subjects repeated measures factors and Disenfranchised Group (Blacks vs. Whites) as a between-subjects factor predicting reaction time on the flanker task. The three-way interaction between information type, trial type, and disenfranchised group was non-significant ($F_{1, 26}$ = 1.032, p = .319). However, there was a significant two-way interaction between Information type

and Disenfranchised Group ($F_{1, 26} = 14.258$, $p = .001$), presented in Figure 6, such that Blacks were faster to respond to the stigmatized health information trials compared to the control health information and non-health control information ($M_{HIV} = 747.923$, $SD_{HIV} = 194.402$, $M_{FLU} = 754.987$, $SD_{FLU} = 194.727$, $M_{BOX} = 761.584$, $SD_{BOX} = 187.873$; $F_{1, 26} = 11.494$, $p = .002$). In contrast, Whites were slower to respond to the stigmatized health information trials compared to the control health information and non-health control information ($M_{HIV} = 654.191$, $SD_{HIV} = 170.022$, $M_{FLU} = 628.100$, $SD_{FLU} = 185.850$, $M_{BOX} = 638.358$, $SD_{BOX} = 162.264$; $F_{1, 26} = 3.801$, $p = .062$). In addition, there was a marginally significant main effect of race such that Blacks tended to be slower overall compared to Whites ($M_{Blacks} = 754.458$, $SD_{Blacks} = 267.766$, $M_{Whites} = 640.340$, $SD_{Whites} = 227.264$; $F_{1, 26} = 3.567$, $p = .070$). Finally, there was a significant main effect of our method factor, trial type, such that participants were slower to respond to the incongruent versus congruent trials ($M_{Incongruent} = 748.447$, $SD_{Incongruent} = 180.039$, $M_{Congruent} = 646.130$, $SD_{Congruent} = 159.360$; ($F_{1, 26} = 108.012$, $p < .001$).

Attention to Paragraphs

To check for differences in reading time as a function of Disenfranchised Group and Information type, we used Repeated Measures Analysis of Variance on the total amount of time spent reading information from each of the categories of interest (stigmatized health information, control health information, and non-health control information). Duration of time in milliseconds spent reading was adjusted to control for total number of words present in each of the categories. As such, the dependent measure for attention to the paragraphs is presented as time spent reading in milliseconds per word. Results suggested that the interaction between Information type and Disenfranchised Group was marginally significant ($F_{1, 26} = 3.922$, $p = .058$), and is presented in Figure 7. In particular, Blacks compared to Whites spent significantly less time reading

information about stigmatized health issues (M_{Blacks} = 48.396, SD_{Blacks} = 26.583, M_{Whites} = 56.448, SD_{Whites} = 17.361; $F_{1, 24}$ = 4.767, p = .039). However, there was no difference as a function of group membership for control health information (M_{Blacks} = 53.564, SD_{Blacks} = 27.321, M_{Whites} = 53.189, SD_{Whites} = 14.720; $F_{1, 24}$ = 0.957, p = .338) or non-health control information (M_{Blacks} = 46.500, SD_{Blacks} = 21.633, M_{Whites} = 45.217, SD_{Whites} = 12.553; $F_{1, 24}$ = 1.518, p = .230). Furthermore, across Disenfranchised Group, there was a main effect of information such that participants spent more time reading control health information, compared to stigmatizing health information and non-health control information (M_{FLU} = 53.376, SD_{FLU} = 4.134, M_{HIV} = 52.422, SD_{HIV} = 4.243, M_{BOX} = 45.859, SD_{BOX} = 3.342; $F_{1, 26}$ = 7.756, p = .010). In particular, the amount of time spent reading was significantly different for stigmatizing compared to non-health control information (HIV vs. BOX: p = .010), and for control health condition compared to the non-health control information (FLU vs. BOX: p = .006), but not for stigmatizing compared to control health information (HIV vs. FLU: p = .687). The main effect of race was non-significant ($F_{1, 26}$ = 0.084, p = .774).

Overall, the faster reaction times on the flanker task for Blacks when presented with stigmatized health issue trials compared to control health issue trials or non-health control issue trials suggests that the stigmatized health issue flanker word (HIV) captured less attention relative to the other two conditions. Furthermore, Blacks compared to Whites spent less time reading information about stigmatized health issues. As such, the findings from this study parallel the results of Chapter 3, in that Blacks compared to Whites were allocating less attention to information about stigmatized health issues. In the next study, we probe this further using ERP as well as self-report measures of response to information.

Study 6: An ERP Investigation of Attention to Health Information for Members of Disenfranchised Groups

Overview

In Study 6, we used self-report and psychophysiological measures (ERP) to measure participants' responses to information about a variety of issues (HIV, FLU, and a non-health relevant control, BOX). The study was identical to Study 5 with the addition of ERP to measure attention and self-report to measure participant's response to the information. In addition to the behavioral measures of attention discussed in Study 5, amplitude differences from the N100 and P300 components of the ERP were used as markers of attention (Hillyard et al., 1973; Luck, 2005). In addition, we assessed activation of impression, defense, and fear-reduction motives in response to the information via self-report.

Methods

Participants and Design

Participants were 27 clients of the Champaign-Urbana Public Health District (15 Blacks and 12 Whites), who had normal or corrected-to-normal audition and vision.[4] Participants were paid $40 for their participation.

The design of the study was identical to Study 5. In line with the theoretical framework, we predicted that the orientation attention component, indexed by N100 amplitude, would be highest when threatening information is presented to members of disenfranchised groups. In

[4] Two participants (1 White and 1 Black) self-identified as HIV-positive on the post-test questionnaire. However, excluding these participants did not change the pattern of results. As such, both participants are included in all subsequent analyses.

contrast, we predicted that executive attention, indexed by P300 amplitude, would be lowest when threatening information is presented to members of disenfranchised groups.

Procedure

The procedure of Study 6 was identical to that of Study 5 with the addition of psychophysiological and self-report measures. First, participants were attached to the EEG using a cap with 32 scalp sites, with the electrodes referenced to the left and right mastoid signal. In addition, to capture horizontal movements and eye blinks as measures of artifacts, electrodes were attached to both the outer corners of each eye as well as below the left eye. Participants then completed the practice block of trials discussed above to familiarize them with the task. Next, participants completed five experimental blocks. As mentioned previously, each block consisted of one paragraph about each of the information types (HIV, FLU, and BOX) followed by 36 trials of the flanker task (three of each trial type) per block (180 trials total; 15 of each trial type). Finally, participants completed post-test measures of impression, defense, and fear-reduction motives in response to the information.

Measures of Attention and Emotional Response and Beliefs

Attention. Attention was measured in four ways. The primary behavioral measure of attention was assessed using reaction time to the flanker task. As a secondary behavioral measure of attention, we also computed the average amount of time spent reading the paragraphs about each of the target issues (HIV, FLU, and BOX). Finally, differences in amplitude for both the N100 and P300 components were measured.

Self-Reported Measures of Motives. Participants' response to information was measured with self-report by asking participants whether or not they *strongly disagreed, disagreed, were*

uncertain, agreed, or *strongly agreed* with statements about information from each condition (HIV, FLU, BOX) corresponding to the motives of interest (impression, defense, and fear-reduction). Specifically, we asked participants to report experiences related to impression motive (a) "The ___ paragraphs made me feel embarrassed," and (b) "The ___ paragraphs made me feel ashamed" (for HIV: inter-item $r_{22} = 0.979$, $p < .001$; for FLU: inter-item $r_{23} = 0.984$, $p < .001$; for BOX: inter-item $r_{23} = 1.000$, $p < .001$). We also asked participants to report experiences related to defense motive (c) "The ___ paragraphs made me feel like somebody wanted to convince me to do something I did not want to do," and (d) "I thought the ___ paragraphs tried to force me to change my beliefs or behaviors" (for HIV: inter-item $r_{21} = 0.567$, $p = .007$; for FLU: inter-item $r_{23} = 0.586$, $p = .003$; for BOX: inter-item $r_{23} = 0.858$, $p < .001$). To assess fear-reduction motives we also asked participants to report their agreement with the statements (e) "The ___ paragraphs made me nervous," and (f) "The ___ paragraphs made me worry" (for HIV: inter-item $r_{21} = 0.637$, $p = .002$; for FLU: inter-item $r_{23} = 0.792$, $p < .001$; for BOX: inter-item $r_{23} = 1.000$, $p < .001$).

Analytic Strategy

For the behavioral data, reaction times on the flanker task were log transformed and trimmed to two and a half standard deviations above and below the mean, with inaccurate trials set as missing values. Subsequently, reaction times for each of the categories of interest were averaged (HIV congruent, HIV incongruent, FLU congruent, FLU incongruent, BOX congruent, BOX incongruent).

For the ERP analyses, EEG was recorded continuously for the duration of each flanker trial, including a 100-ms prestimulus baseline prior to the presentation of the trial and continued for an additional 800 ms (jittered between 800ms-1200ms) post-response. In addition, to

minimize artifacts, participants were instructed to avoid eye blinks and other body movements as much as possible during the flanker task.

Data were collected using the BioSemi ActiveTwo system with active electrodes. All electrode impedances were kept below 5 kΩ. After data collection, the EEG was filtered with a bandpass of 0.10-30 Hz. Trials including artifacts (e.g., eye blinks, muscle movement, etc.) were removed prior to data analyses. Subsequently, ERP epochs were selected from the continuous EEG output. Specifically, 900ms intervals (100ms pre-stimulus onset through 800ms post-stimulus onset) were obtained to measure attention. Finally, the ERPs were re-filtered at .01-15 Hz. To analyze attention, N100 and P300 ERPs were derived separately for each information type (HIV, FLU, and BOX) for both African-Americans and European-Americans. N100 was scored as the mean amplitude between 80-110ms, whereas the P300 was scored as the mean amplitude between 350-650ms. Three participants (all Blacks) were excluded from the analyses because of technical issues with the recording of the ERP data. All analyses were subsequently performed on the remaining 24 participants (12 Blacks and 12 Whites).

Results

We wanted to test the hypothesis that Blacks relative to Whites would pay less attention to information about stigmatizing health information compared to control health information or non-health control information. In this case, we used Repeated-Measures Analysis of Variance to predict both reaction time to the flanker task as well as amount of time spent reading the paragraphs on each topic. In addition, we also used Repeated-Measures Analysis of Variance to predict mean amplitude of the N100 and P300 components.

Behavioral Measures

Reaction Time to the Flanker Task. As in Study 5, we were primarily interested in how the presence of words relevant to the categories of interest (HIV, FLU, and BOX) would influence performance on a modified Erikson flanker task. We first checked to see if there were any effects across counterbalancing condition (Target arrow direction: Right vs. Left). However, there was no difference in the direction of the target arrow (left vs right; F (1, 23) = 1.855, p = .186), so we collapsed across counterbalancing conditions. Next, we used Repeated Measures Analysis of Variance to test our main hypothesis that Blacks compared to Whites would be differentially affected by the presence of stigmatized health information flankers (HIV) compared to control health information flankers (FLU) or non-health control flankers (BOX). We used a Repeated-Measures Analysis of Variance with Information type (Stigmatized health vs. Control health vs. Non-health control) and Trial type (Congruent vs. Incongruent) as two within-subjects repeated measures factors and Disenfranchised Group (Blacks vs. Whites) as a between-subjects factor predicting reaction time on the flanker task. The three-way interaction between information type, trial type, and disenfranchised group was non-significant ($F_{1, 22}$ = 1.099, p = .306). However, there was a marginally significant two-way interaction between Information type and Disenfranchised Group ($F_{1, 22}$ = 3.063, p = .094), which is presented in Figure 8, such that Blacks trended toward responding faster to the stigmatized health information trials compared to the control health information and non-health control information (M_{HIV} = 754.232, SD_{HIV} = 171.764, M_{FLU} = 766.169, SD_{FLU} = 166.641, M_{BOX} = 755.969, SD_{BOX} = 159.806; $F_{1, 22}$ = 2.097, p = .175). In contrast, Whites trended toward responding slower to the stigmatized health information trials compared to the control health information and non-health control information (M_{HIV} = 589.279, SD_{HIV} = 234.358, M_{FLU} = 578.767, SD_{FLU} = 235.159, M_{BOX} = 579.172, SD_{BOX} = 244.094; $F_{1, 22}$ = 1.641, p = .227). In addition, there was a main effect of race on reaction time, such that Blacks were slower to respond to all trials compared to Whites

(M_{Blacks} = 758.999, SD_{Blacks} = 63.215, M_{Whites} = 582.308, SD_{Whites} = 48.499; $F_{1, 22}$ = 5.406, p = .030). Finally, there was a significant main effect of our method factor, trial type, such that participants were slower to respond to the incongruent versus congruent trials ($M_{Incongruent}$ = 709.812, $SD_{Incongruent}$ = 228.650, $M_{Congruent}$ = 622.660, $SD_{Congruent}$ = 204.618; ($F_{1, 22}$ = 69.796, p < .001). Overall, the general pattern of reaction times to the flanker tasks (faster reaction times for Blacks when the flanker is stigmatized health information compared to control health information and non-health control information) replicated that of Study 5.

Attention to Paragraphs. To check for differences in reading time as a function of Disenfranchised Group and Information type, we used Repeated Measures Analysis of Variance on the total amount of time spent reading information from each of the categories of interest (stigmatized health information, control health information, and non-health control information). Duration of time in milliseconds spent reading was adjusted to control for total number of words present in each of the categories (milliseconds per word). Results indicated that the interaction between Information type and Disenfranchised Group was marginally significant ($F_{1, 22}$ = 3.563, p = .072), and is presented in Figure 8. In particular, Blacks compared to Whites spent significantly more time reading information about control health information (M_{Blacks} = 63.764, SD_{Blacks} = 39.594, M_{Whites} = 48.687, SD_{Whites} = 22.769; $F_{1, 22}$ = 5.915, p = .025) and non-health control information (M_{Blacks} = 77.207, SD_{Blacks} = 39.434, M_{Whites} = 52.610, SD_{Whites} = 19.658; $F_{1, 22}$ = 9.624, p = .006). However, there was no difference as a function of group membership for stigmatizing health information (M_{Blacks} = 60.500, SD_{Blacks} = 25.646, M_{Whites} = 51.582, SD_{Whites} = 25.920; $F_{1, 22}$ = 0.046, p = .832). Furthermore, across Disenfranchised Group, there was a main effect of information such that participants spent more time reading non-health information, compared to stigmatizing health information and control health information (M_{BOX} = 64.908, SD_{BOX} = 31.158, M_{HIV} = 56.041, SD_{HIV} = 25.783, M_{FLU} = 56.226, SD_{FLU} = 32.294; $F_{1, 22}$ = 4.559,

p = .044). In particular, the amount of time spent reading was significantly different for stigmatizing compared to non-health control information (HIV vs. BOX: p = .044), and for control health condition compared to the non-health control information (FLU vs. BOX: p < .001), but not for stigmatizing compared to control health information (HIV vs. FLU: p = .963). Finally, there was a trend of an influence of race on time spent reading, such that Blacks spent more time reading compared to Whites (M_{Blacks} = 67.157, SD_{Blacks} = 8.158, M_{Whites} = 50.960, SD_{Whites} = 8.158; $F_{1, 22}$ = 1.971, p = .174). Overall, the pattern of time spent reading the stigmatized and control health information replicated that of Study 5. However, the pattern of time spent reading the non-health control information did not replicate the pattern seen in Study 5.

ERP Analyses

N100. Because increased amplitude of the N100 component is associated with orienting attention to threatening compared to control stimuli (Hillyard et al., 1973; Luck, 2005), we hypothesized that information about stigmatized health information should elicit increased amplitude of the N100 component compared to either control health information or non-health control information. We hypothesized that the threat of stigmatized health information, and subsequently the N100 amplitude, would be greatest for disenfranchised groups, in this case Blacks compared to Whites. We used a Repeated-Measures Analysis of Variance with Information type (Stigmatized health vs. Control health vs. Non-health control) and Trial type (Congruent vs. Incongruent) as two within-subjects repeated measures factors and Disenfranchised Group (Blacks vs. Whites) as a between-subjects factor predicting N100 amplitude. The three-way interaction between information type, trial type, and disenfranchised group was non-significant ($F_{1, 22}$ = 0.705, p = .410). However, there was a trending two-way

interaction between Information type and Disenfranchised Group ($F_{1, 22} = 1.951$, $p = .176$), which is presented in Figure 10. Furthermore, there was a main effect of information type, such that there was more negativity (higher amplitude) for stigmatizing health information compared to control health information and non-health control information ($M_{HIV} = -4.586$, $SD_{HIV} = 2.506$, $M_{FLU} = -3.594$, $SD_{FLU} = 2.890$, $M_{BOX} = -2.811$, $SD_{BOX} = 4.318$; $F_{1, 22} = 5.005$, $p = .036$). In addition, there was a main effect of race, such that Blacks compared to Whites showed less negativity in response to all information types ($M_{Blacks} = -1.988$, $SD_{Blacks} = 2.200$, $M_{Whites} = -5.339$, $SD_{Whites} = 2.200$; $F_{1, 22} = 13.933$, $p = .001$). Within Blacks, the effect of information type remained significant, ($M_{HIV} = -3.463$, $SD_{HIV} = 2.277$, $M_{FLU} = -1.920$, $SD_{FLU} = 2.042$, $M_{BOX} = -0.581$, $SD_{BOX} = 3.704$; $F_{1, 22} = 6.603$, $p = .018$). However, within Whites, the effect of information no longer approached significance ($M_{HIV} = -5.708$, $SD_{HIV} = 2.278$, $M_{FLU} = -5.268$, $SD_{FLU} = 2.679$, $M_{BOX} = -5.041$, $SD_{BOX} = 3.796$; $F_{1, 22} = 0.353$, $p = .559$).

P300. Because increased amplitude of the P300 component is associated with executive control of attention to stimuli (Hillyard et al., 1973; Luck, 2005), we hypothesized that if members of disenfranchised groups are disengaging from information about stigmatized health information, this should result in decreased amplitude of the P300 component for stigmatized health information compared to either control health information or non-health control information. We hypothesized that members of disenfranchised groups in particular would allocate fewer attentional resources to information about stigmatized health information, as indexed by decreased P300 amplitude. We used a Repeated-Measures Analysis of Variance with Information type (Stigmatized health vs. Control health vs. Non-health control) and Trial type (Congruent vs. Incongruent) as two within-subjects repeated measures factors and Disenfranchised Group (Blacks vs. Whites) as a between-subjects factor predicting P300 amplitude. The three-way interaction between information type, trial type, and disenfranchised

group was marginally significant ($F_{1, 22} = 3.931$, $p = .060$). Within Blacks, there was a marginal main effect of information type, such that there was less positivity (lower amplitude) for stigmatizing health information and control health information compared to non-health control information ($M_{HIV} = 2.385$, $SD_{HIV} = 1.628$, $M_{FLU} = 2.045$, $SD_{FLU} = 2.387$, $M_{BOX} = 3.827$, $SD_{BOX} = 2.118$; $F_{1, 22} = 2.031$, $p = .168$). In particular, P300 amplitude was significantly different for control health compared to non-health control information (FLU vs. BOX: $p = .031$), and marginally different for stigmatized health compared to non-health control information (HIV vs. BOX: $p = .073$). However, there was no difference in P300 amplitude for stigmatized health compared to control health (HIV vs. FLU: $p = .608$). Within Whites, there was a marginal two-way interaction between information type and trial type, such that there was a larger discrepancy in P300 amplitude in response to incongruent compared to congruent trials for stigmatizing health information and non-health control information compared to control health information ($M_{HIV} = 2.042$, $SD_{HIV} = 7.926$, $M_{FLU} = -0.245$, $SD_{FLU} = 5.162$, $M_{BOX} = 4.257$, $SD_{BOX} = 7.219$; $F_{1, 22} = 6.258$, $p = .020$). Finally, there was a trend of race on P300 amplitude, such that Blacks compared to Whites showed less positivity in response to all information types ($M_{Blacks} = 2.752$, $SD_{Blacks} = 3.606$, $M_{Whites} = 4.808$, $SD_{Whites} = 3.606$; $F_{1, 22} = 1.971$, $p = .174$).

Self-Report Measures

We were also interested in how information type and disenfranchised group membership would correspond to activation of impression, defense, and fear-reduction motives. We predicted that impression motive activation would be highest for disenfranchised group members (in this case, Blacks versus Whites) in response to information about stigmatized health issues compared to information about control health issues or non-health control issues. To test this hypothesis, we used a Repeated-Measures Analysis of Variance with Information type (Stigmatized health

vs. Control health vs. Non-health control) as a within-subjects repeated measures factors and Disenfranchised Group (Blacks vs. Whites) as a between-subjects factor predicting activation of impression, defense, and fear-reduction motives. Neither the two-way interaction nor the main effect of information was significant for any of the three motives of interest (impression, defense, or fear-reduction). However, the main effect of race was significant for all three analyses and is presented in Figure 11, such that Blacks compared to Whites were more likely to report higher levels of the motives of impression, defense, and fear-reduction (for impression: $M_{\text{Blacks}} = 2.367$, $SD_{\text{Blacks}} = 1.140$, $M_{\text{Whites}} = 1.319$, $SD_{\text{Whites}} = 1.043$; $F_{1, 20} = 5.518$, $p = .029$; for defense: $M_{\text{Blacks}} = 2.796$, $SD_{\text{Blacks}} = 1.060$, $M_{\text{Whites}} = 1.361$, $SD_{\text{Whites}} = 0.918$; $F_{1, 19} = 12.596$, $p = .002$; for fear-reduction: $M_{\text{Blacks}} = 2.450$, $SD_{\text{Blacks}} = 1.088$, $M_{\text{Whites}} = 1.458$, $SD_{\text{Whites}} = 0.991$; $F_{1, 20} = 5.452$, $p = .030$).

Discussion

Taken together, these data suggest that Blacks compared to Whites tend to spend less attention to information in general, and information about stigmatized health issues in particular. This attentional deficit is marked by faster reaction times on a flanker task when the flankers contain information about stigmatized health issues (HIV) compared to control health issues (FLU) or non-health control issues (BOX). Faster reaction times suggest less attention capture (i.e., less conflict with the target task) for the HIV compared to FLU or BOX trials. In addition, Blacks spent less time reading information about stigmatized health issues compared to control health or non-health control issues.

One of the major questions posed for Study 6 was to track the time-course of attention to information about stigmatized health issues. One possibility is that information about stigmatized health issues initially captures attention (as indexed by increased N100 amplitude) before

disengagement occurs (as indexed by decreased P300 amplitude) for members of disenfranchised groups. In contrast, members of disenfranchised groups may simply tune out information about stigmatized health issues altogether (decreased N100 and P300 amplitude). Results of the analyses of N100 amplitude suggest that stigmatizing health information does capture attention for both Blacks and Whites. However, there is decreased executive attention (as indexed by decreased P300 amplitude) in response to information about stigmatized health issues for Blacks compared to Whites. Taken together, these findings offer preliminary support for the hypothesis of late disengagement of attention for members of disenfranchised groups in response to information about stigmatized health issues.

We also hoped that the self-report measures of motives would help to sort out the independent contributions of impression, defense, and fear-reduction motives. However, these measures were not particularly useful at differentiating participants' response to materials. Overall, members of disenfranchised groups reported higher levels of all motives compared to non-members. However, these differences did not vary as a function of information type.

Limitations and Future Directions

Study 6 was our first attempt at using ERP to understand attention to health information. As such, there are several important limitations of this study and ideas for future directions. First, there are very large main effects of disenfranchised group membership on most of the measures of attention and motives. However, there are also several key differences between samples besides just group membership that may influence these differences. For instance, even though all participants were selected from the same population (clients of the Champaign-Urbana Public Health District), in this sample, Whites compared to Blacks tended to be younger and better educated (more years of schooling completed), and also tended to both work more hours per

week as well as earn more money annually. Future studies should take these differences in samples into consideration, including taking additional efforts to ensure that the samples are more evenly matched on these dimensions. Furthermore, differences in response time may be due in part to difficulties reading that may operate as a function of group-level differences. Perhaps these differences between samples may be ameliorated, in part, by simplifying the messages to facilitate comprehension by all audiences. In addition, several of the key analyses produced only marginal effects. However, the sample size is relatively small (n = 24), and future work should include recruitment of larger samples.

On a related note, this study did not include measures of attention or working memory capacity apart from performance on the tasks of interest. In the future, additional measures of attention or working memory capacity (e.g., an OSPAN or NBACK task) may provide additional insight into the processes of interest. At the very least, these measures might serve as useful covariates to reduce between-subjects variability.

In addition, there are several features of the study itself that could be modified in future efforts. First, in both Studies 5 and 6, accuracy rates were very high (on average 98% of trials were accurate). However, there was no time limit for participants to respond to the flanker trials. Therefore, future efforts may better address conflict across information type by limiting the amount of time participants have to respond to the trials. In this study, participants were instructed to respond as quickly and accurately as possible. However, future work may instead amplify the desire for speed or include a cut-off response window as a way of increased response conflict. Second, in these studies, participants were instructed to respond to the flanker task using only their dominant hand. However, doing so eliminates the possibility of examining the Lateralized Readiness Potential (LRP), which is calculated by subtracting preparatory response

in left versus right hemispheres, and as such, requires the use of both hands to make responses. LRP may be particularly relevant for examining how much competing activation occurs in response to the incongruent trials (e.g., activation in the left hemisphere when the target response is a left key press; activation in the right hemisphere when the target response is a right key press). Furthermore, the flanker task is useful for assessing attention capture, but perhaps other paradigms (e.g., a Posner cueing task) would be better suited to test the notion of attention disengagement.

Finally, the self-report measures of the motives of interest were not particularly diagnostic. One solution might be to ask questions about how participants feel when reading or thinking about HIV, FLU, or BOX in general rather than participants' responses to the paragraphs in particular. For instance, perhaps participants feel like issues relevant to HIV that were not presented in the paragraphs are more stigmatizing than the information contained in the paragraphs themselves. Another possibility might be to assess participants' beliefs and emotional response to the categories of interest at the beginning rather than at the end of the experiment. In this way, we might get a clearer picture of the beliefs, expectations, and emotional profile participants have coming into the experiment. Finally, prior work suggests that self-report may not be the best way to assess participant response (Schroeder, Carey, & Vanable, 2004). Future work might benefit from manipulating the conditions under which motives of interest might be more salient (e.g., manipulating the presence of others to activate an impression motive), rather than just relying on self-report to disentangle these motivations.

Chapter 6: General Discussion

In six studies, we sought to examine decrements in attention to information about stigmatized health issues by members of disenfranchised groups as a predictor of health disparities. In addition, we examined the antecedents and consequences of an impression motive, and the independent contributions of impression, defense, and fear-reduction motives on attention to information about stigmatized health issues by members of disenfranchised groups.

Taken together, these studies suggest that members of disenfranchised groups are less likely than non-members to attend to information about stigmatized health issues. This pattern holds across vastly different measures of attention, including observations of overt attention in a public health clinic waiting room (Study 1) to millisecond-level responding to a computer-based attention task (Studies 5 and 6). Overall, these studies may help to explain, in part, the existence of health disparities for stigmatized health issues between members of disenfranchised groups and nonmembers by establishing parallel disparities in attention to information about stigmatized health issues.

Furthermore, activation of an impression motive was linked to increased shame in response to information about stigmatized health issues to a greater extent than control health issues (Studies 2-4). Increased shame occurred both in response to environmental factors such as priming stigma (Study 2) or the perceived presence of others (Studies 3 and 4). In addition, chronic and situational cues to stigma activation interacted to produce the highest levels of shame in response to information about stigmatized compared to control health issues (Study 4). Finally, chronic stigma activation (as indexed by membership in a disenfranchised group) was related to higher levels of self-reported impression, defense, and fear-reduction motives across

all information types (Study 6). Although there was no discrimination as a function of information type, increased activation of all motives were present for members of disenfranchised groups versus non-members. These results give initial insight into the processes underlying disparities in attention to information about stigmatized health issues by members of disenfranchised groups, although as discussed above and below, additional work is still necessary to have a complete picture.

An additional area of investigation posed in this thesis was to better understand the time-course of attentional disengagement from information about stigmatized health issues by members of disenfranchised groups. We have some initial evidence that information about stigmatized health issues (e.g., HIV) initially captures attention (Study 6). However, members of disenfranchised groups subsequently disengage attention from information about stigmatized health issues compared to control health information (Studies 1, 5, and 6) or non-health control information (Studies 5-6).

Future Directions

The results of this paper indicate several potentially fruitful future directions. For instance, Studies 3 and 4 suggest that the presence of others may be a critical predictor of impression motive activation and subsequent shame. To the extent that impression motive activation is at play, the presence of others may subsequently decrease attention to information about stigmatized health issues for members of disenfranchised groups. Unfortunately, these are precisely the conditions under which information about preventing stigmatized health issues is typically presented at public health facilities and hospitals. More effective strategies of information dissemination might include offering information about preventing stigmatized health issues after participants have left the main waiting room. For instance, perhaps intervening

when participants are waiting for a health care practitioner alone in an individual clinic room versus in a public waiting room when others are most likely present. In addition, future work should address the role of the presence of others on attention to information about stigmatized health issues by members of disenfranchised groups in the field. For instance, is it the case that the presence of any "other" may activate an impression motive and subsequent avoidance of information about stigmatized health issues? Or is it the case that similar others may exacerbate or ameliorate the effects of an impression motive on attention? Perhaps it is the case that beliefs or expectations about how the "other" will interpret one's attention to stigmatized health information may moderate the impact of the other's presence.

Another potential future direction is to more closely examine the nature of stigma and its role in attention to information about stigmatized health issues. For instance, is decreased attention to information about stigmatized health issues by members of disenfranchised groups due to general stigma activation (i.e., a history of discrimination)? Or is it the case that highlighting specific features of one's identity may subsequently increase or decrease approach to information about stigmatized health issues? In particular, highlighting stigmatized identity features that are associated with a particular stigmatized health issue (e.g., African-American racial identity or homosexual sexual identity with HIV) may produce differential effects on attention than highlighting stigmatized identity features that are unrelated to a particular stigmatized health issue (e.g., obesity with HIV). Teasing apart the sources of stigma activation, and the impact of this activation on information selection, may give additional insight into the processes underlying attention to information about stigmatized health issues.

Additional efforts may also be directed toward decreasing participants' concern about the impression made on others as a way of increasing engagement with information about preventing stigmatized health issues. For instance, affirming an important self-concept (e.g., "I am a healthy

person") might trigger approach to rather than avoidance of information about prevention (Steele, 1988). An affirmation could be cheaply and easily administered via a meta-intervention, or scripted introduction to a pre-existing intervention program, including a brochure or video, designed to increase enrollment in the program (Albarracin, Durantini, Earl, Gunnoe, & Leeper, 2008). Future work should also address the possibility of decreasing the salience of impression motives as a way of increasing attention to health information.

Finally, one assumption about intervention research in general is that the removal of barriers should, in turn, increase the target behavior. However, in the case of attention to information about stigmatized health issues, removing barriers (e.g., reducing an impression motive) may not be enough to increase attention. For instance, the removal of barriers without additional motivating factors (e.g., improving health for the self or close others) may be necessary but not sufficient to change behavior. As such, perhaps shame-reduction interventions would be more effective if coupled with interventions designed to increase approach-oriented emotions.

Overall, the issue of health disparities is particularly salient among members of disenfranchised groups such as African-Americans. However, this is a problem that is solvable. By better understanding the processes underlying attention to information about stigmatized health issues by members of disenfranchised groups, there is hope that we can reach the audiences for whom health-promotion messages are designed, and ultimately, improve health outcomes for all.

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Figures

Figure 1. A theoretical framework examining attention to health information as a function of group membership and type of information available.

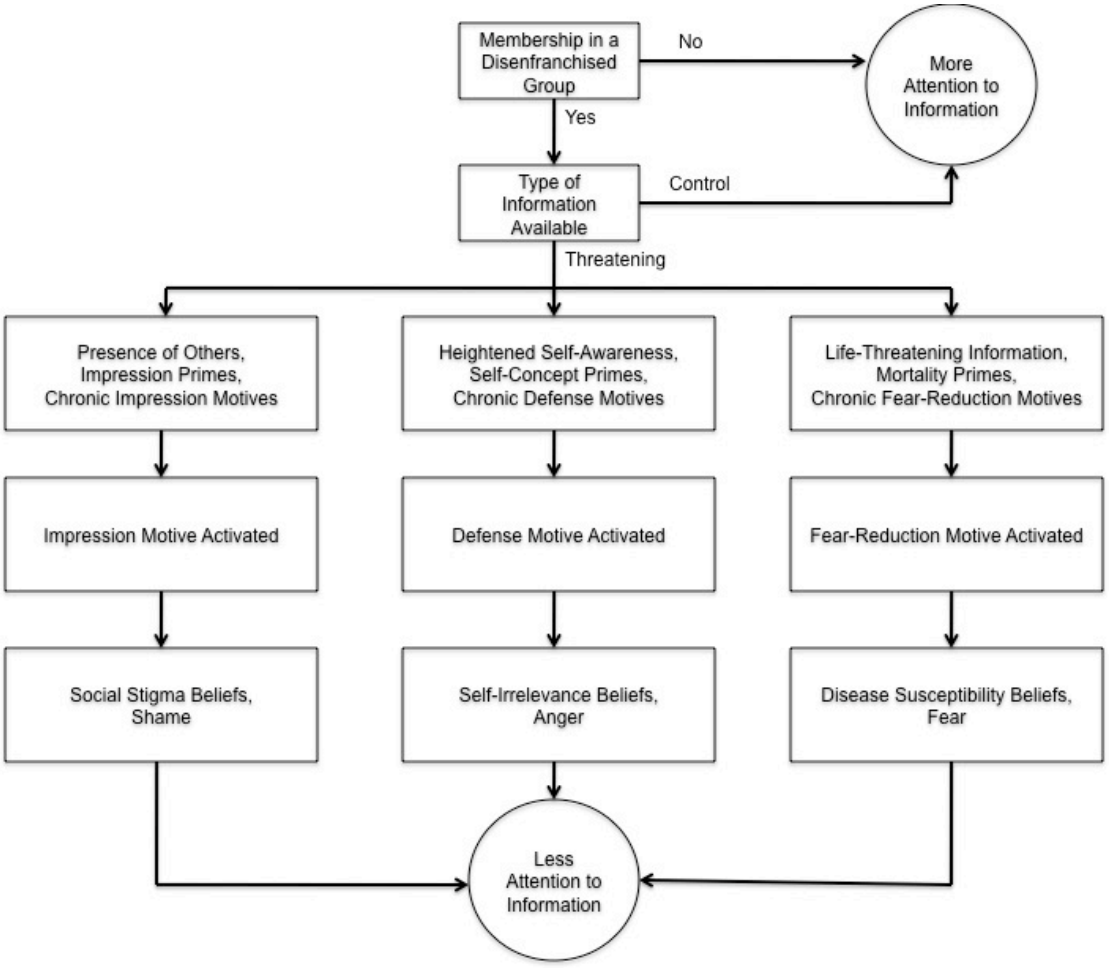


Figure 2. Attention to health information for African-Americans versus European-Americans in a waiting room setting. Error bars correspond to standard error.

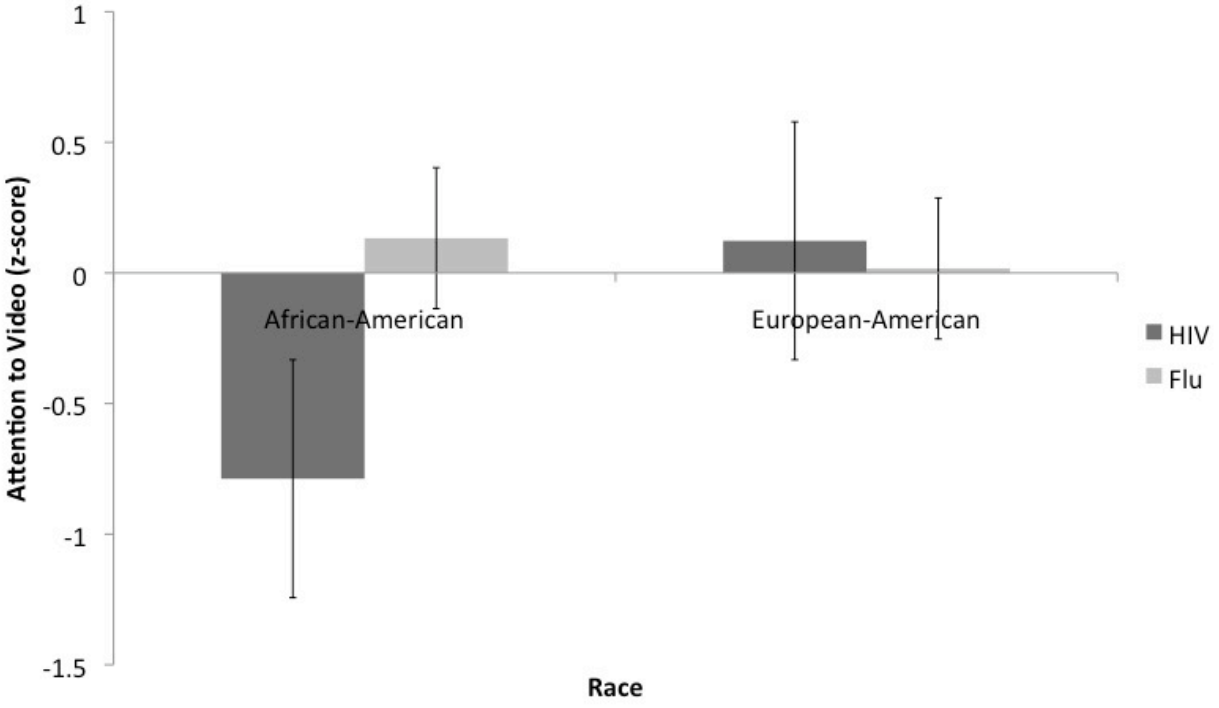


Figure 3. The effects of priming impression-relevant versus control concepts on shame. Error bars correspond to standard error.

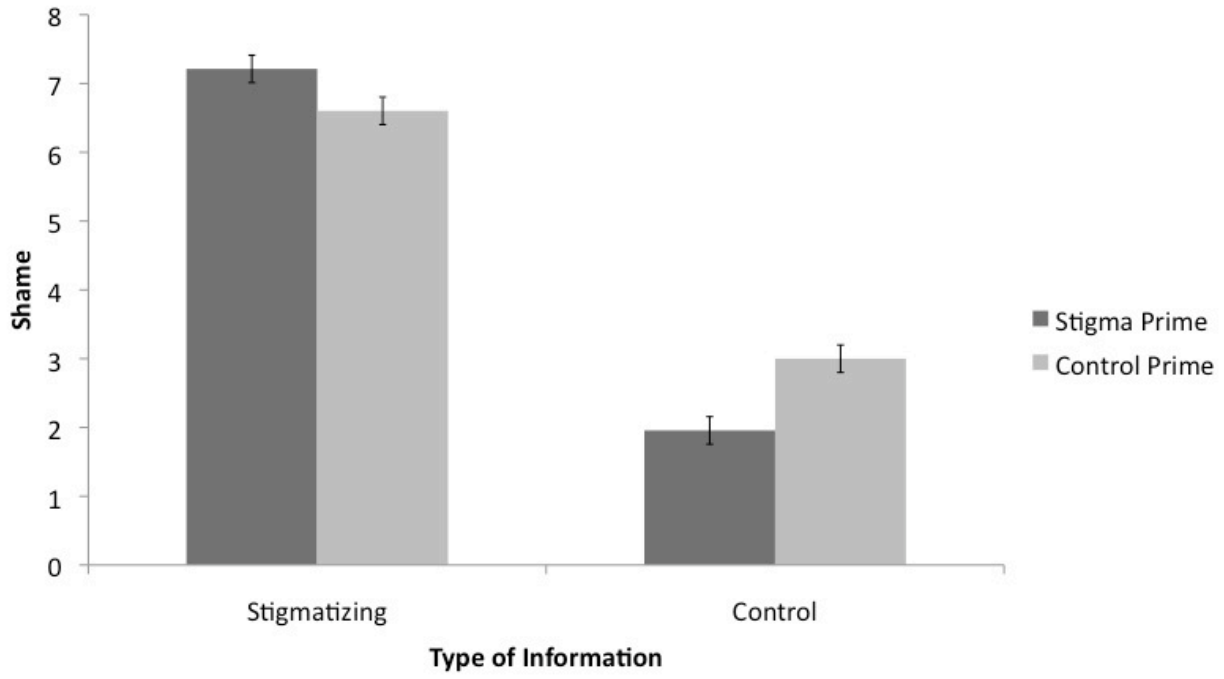


Figure 4. The effects of perceived presence of others versus alone on shame. Error bars correspond to standard error.

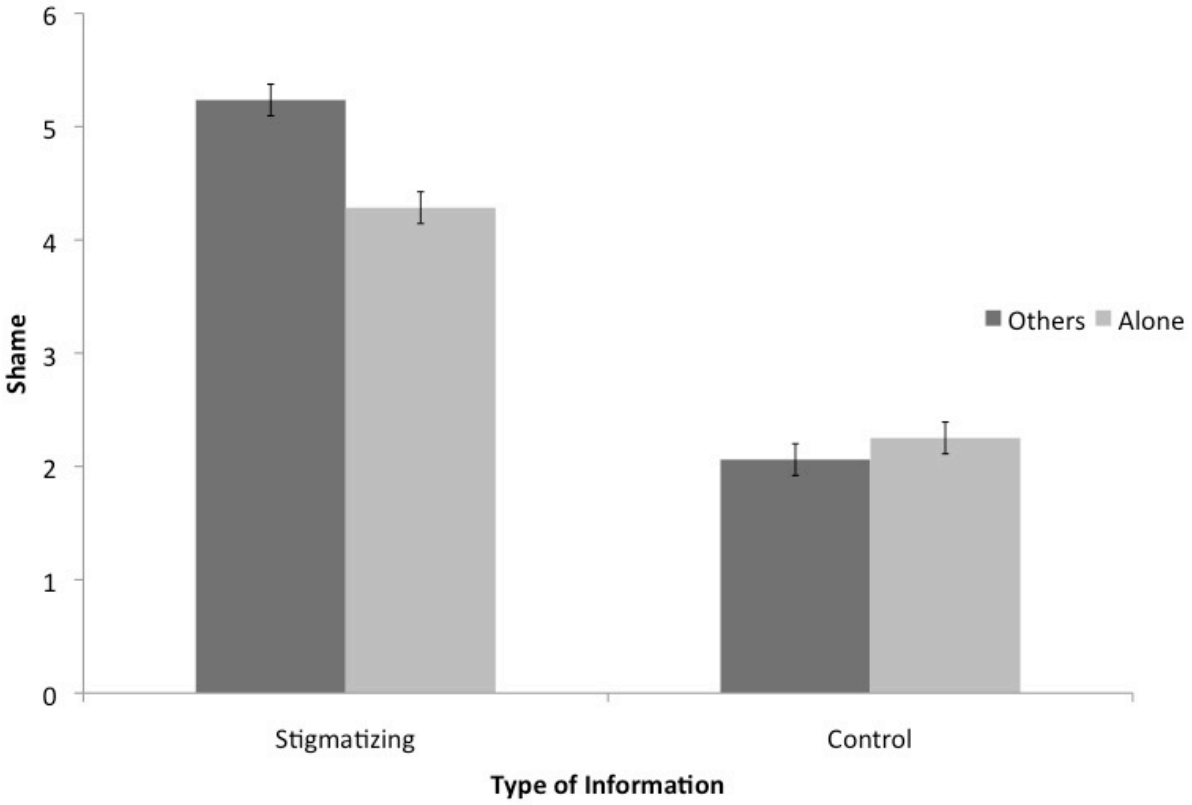


Figure 5. Examining the interactive influences of chronic and situational cues to impression motives on shame. Error bars correspond to standard error.

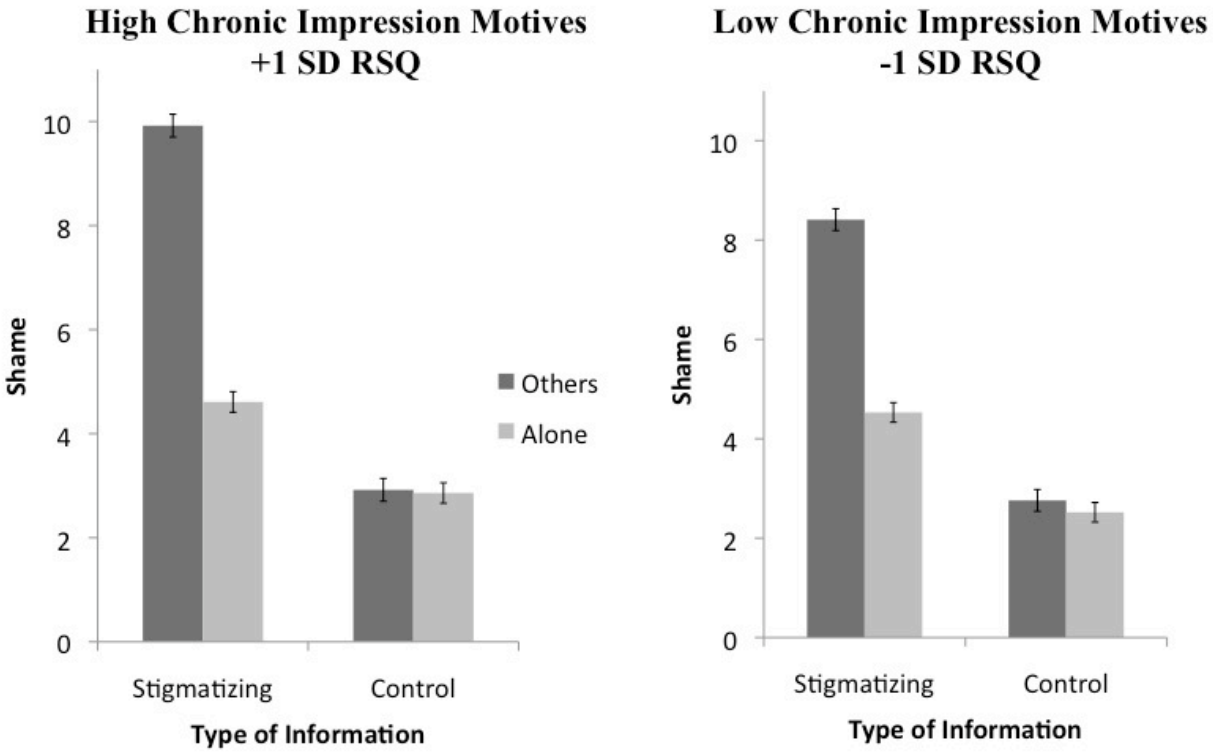


Figure 6. Reaction time on a modified flanker task as a function of information type and membership in a disenfranchised group in a pilot sample. Error bars correspond to standard error.

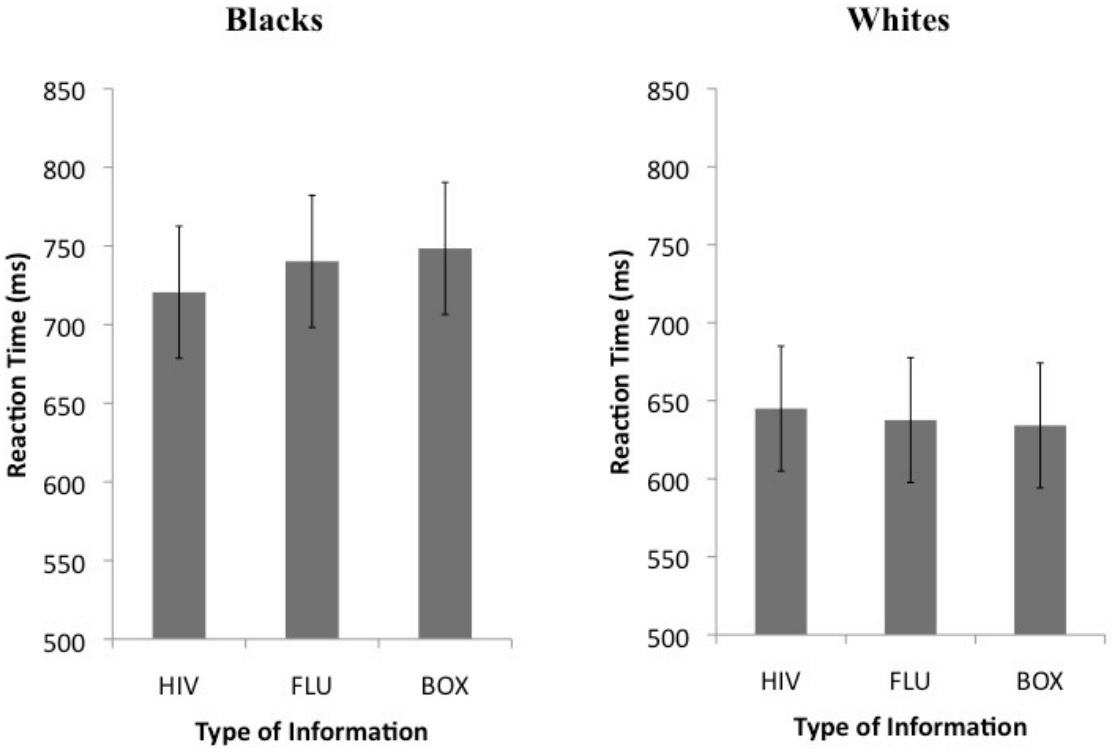


Figure 7. Attention to paragraphs as a function of information type and membership in a disenfranchised group in a pilot sample. Error bars correspond to standard error.

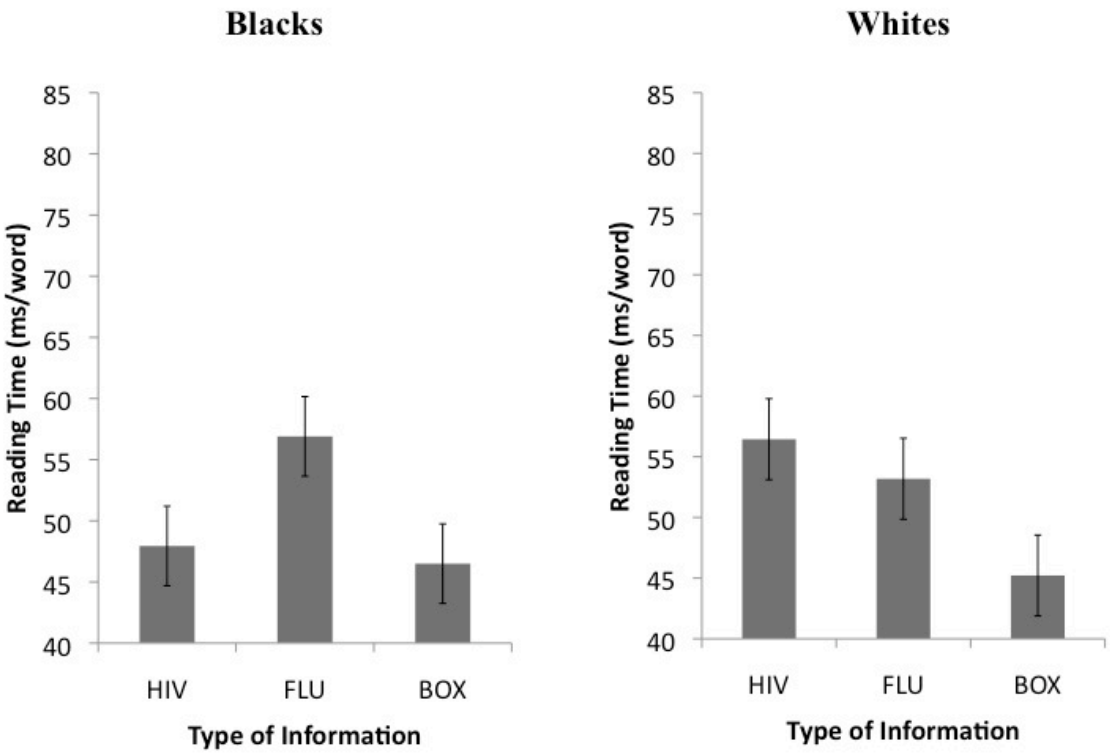


Figure 8. Reaction time on a modified flanker task as a function of information type and membership in a disenfranchised group in a health department sample. Error bars correspond to standard error.

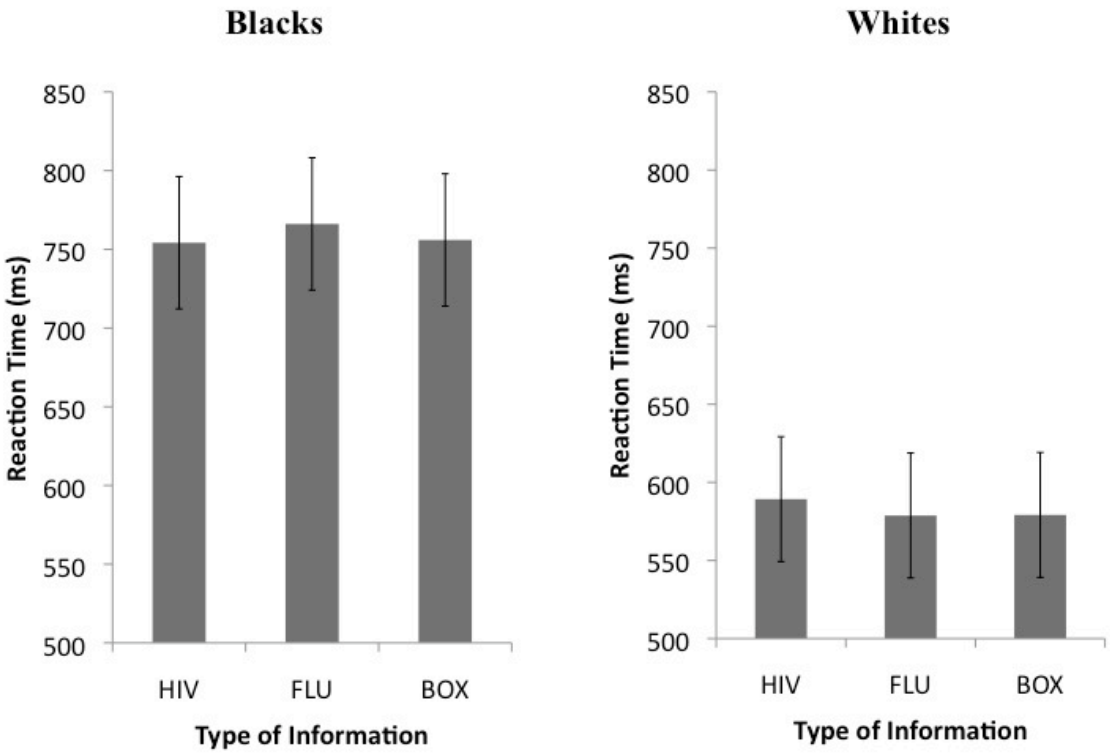


Figure 9. Attention to paragraphs as a function of information type and membership in a disenfranchised group in a health department sample. Error bars correspond to standard error.

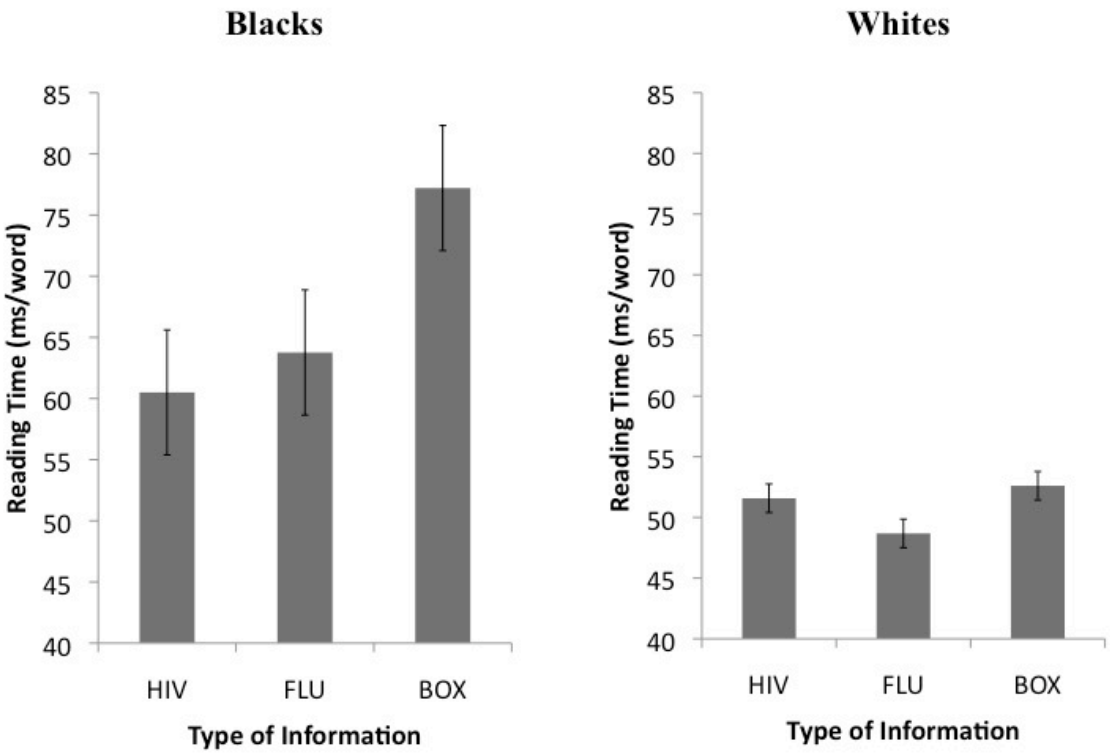


Figure 10. Event Related Potentials as a function of information type and membership in a disenfranchised group.

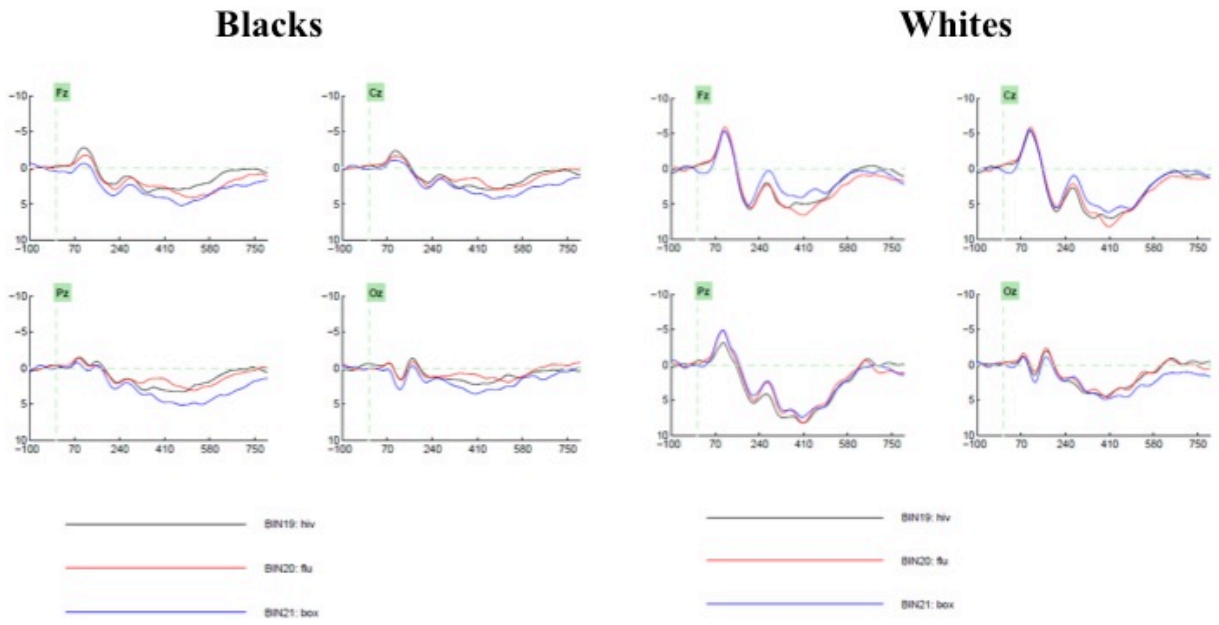
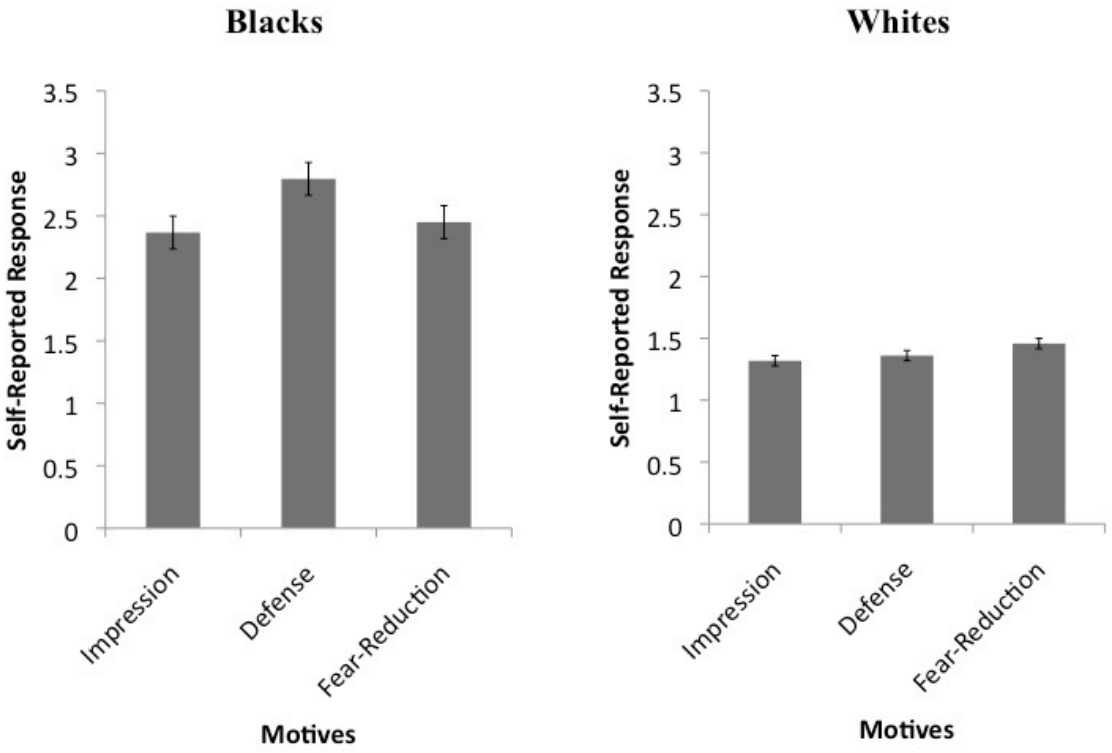
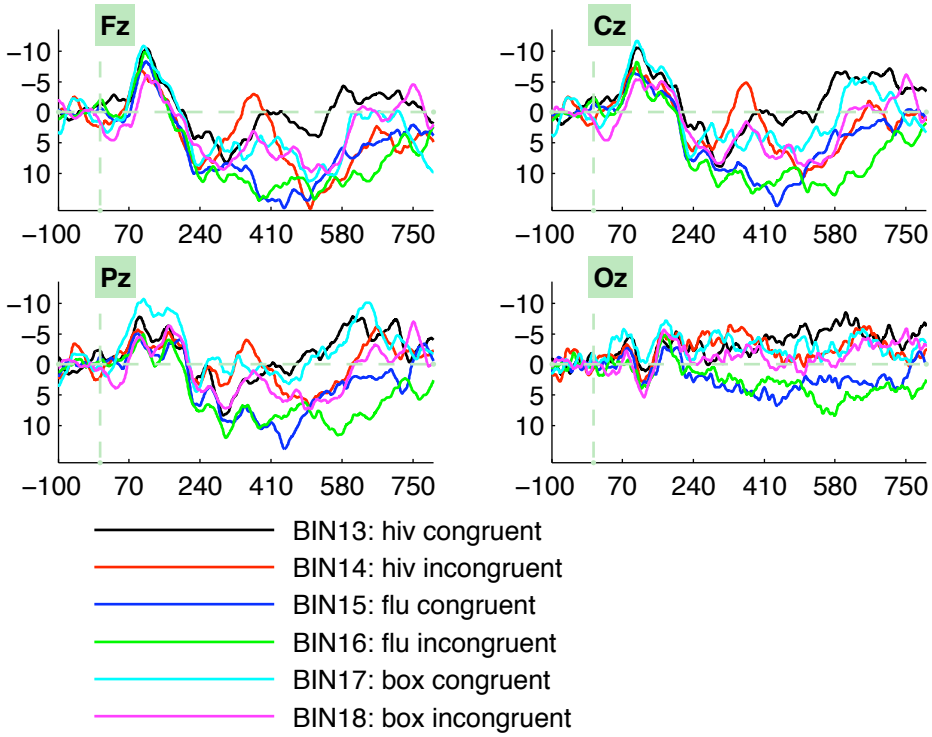


Figure 11. Self-report measures of activation of the motives of interest (impression, defense, and fear-reduction) as a function of membership in a disenfranchised group.



Appendix A: Participants' Individual ERP Waveforms



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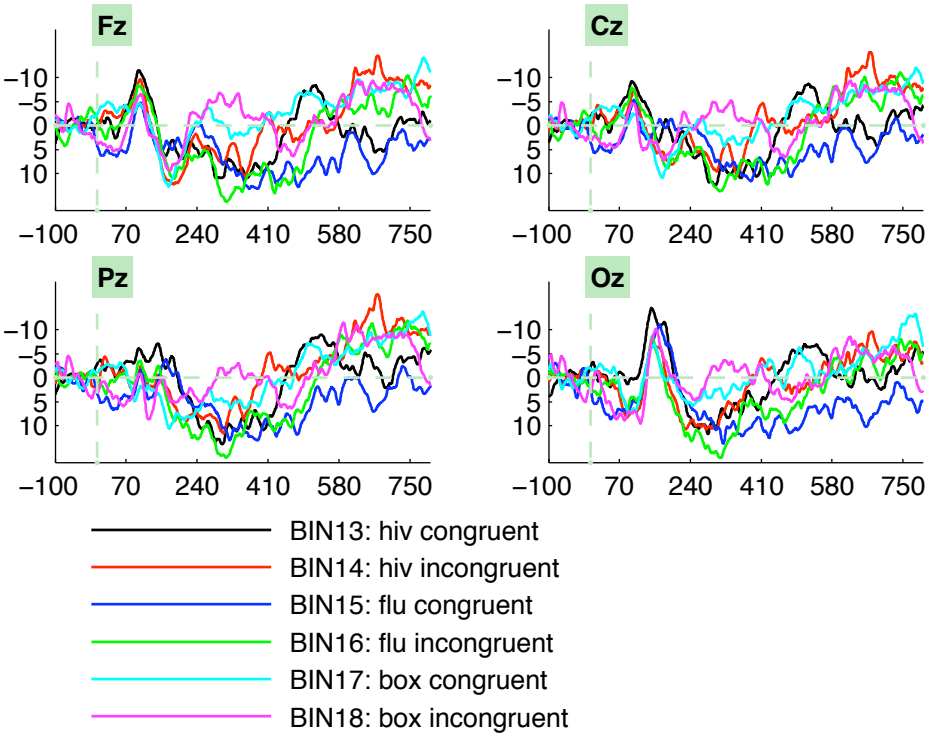

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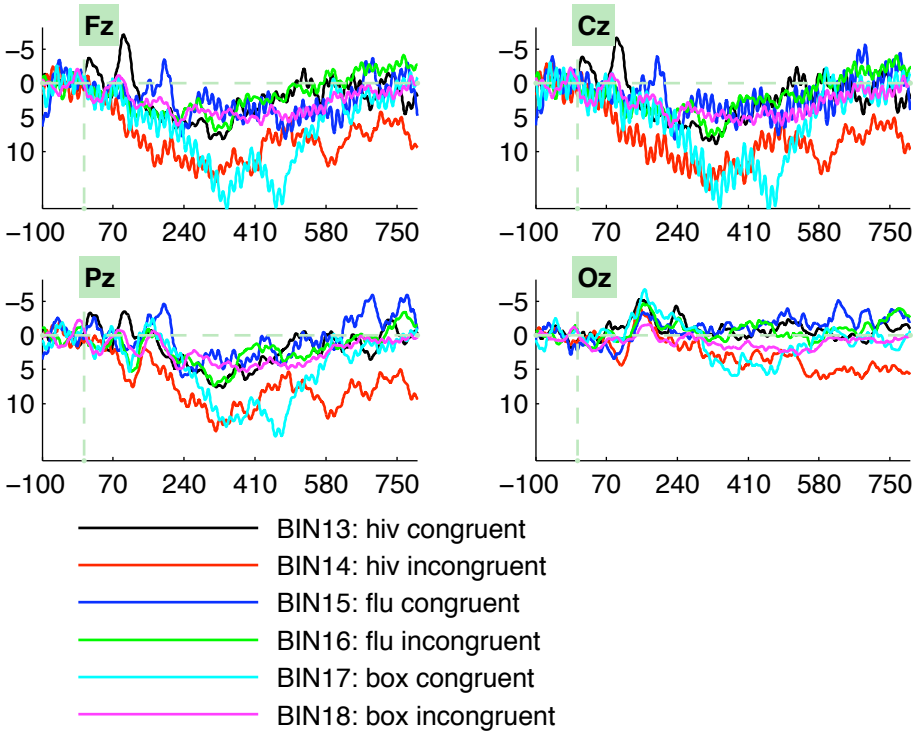

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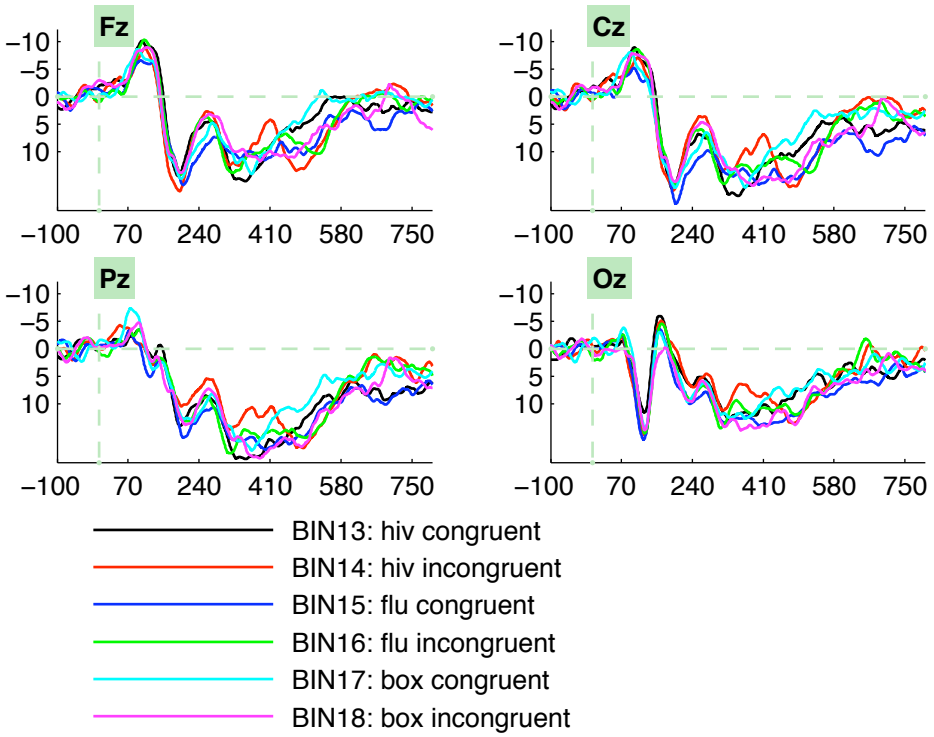

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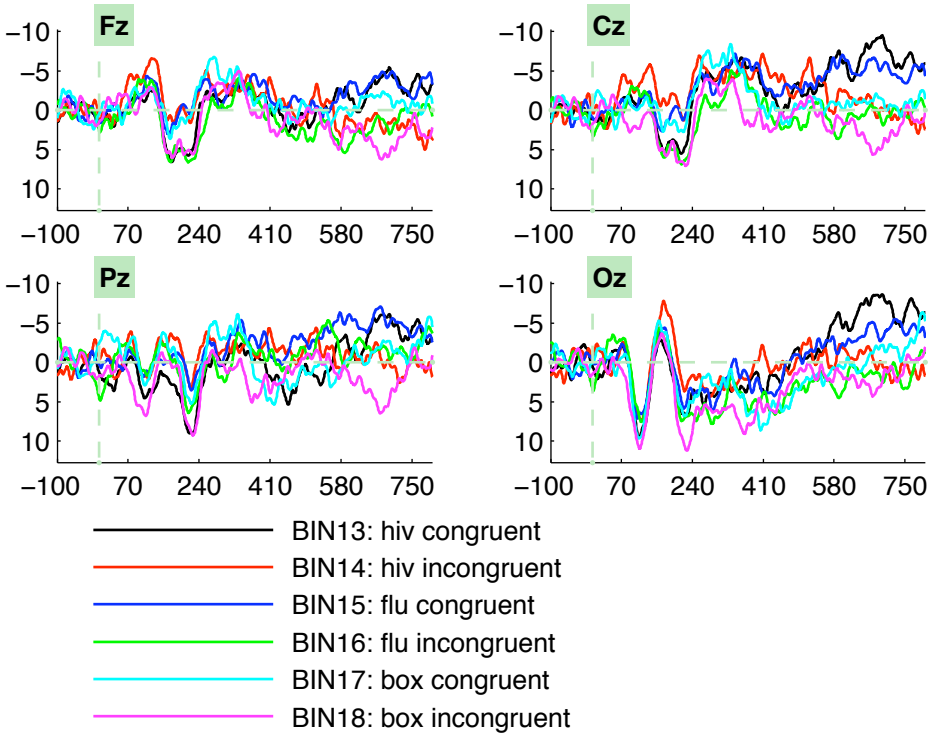

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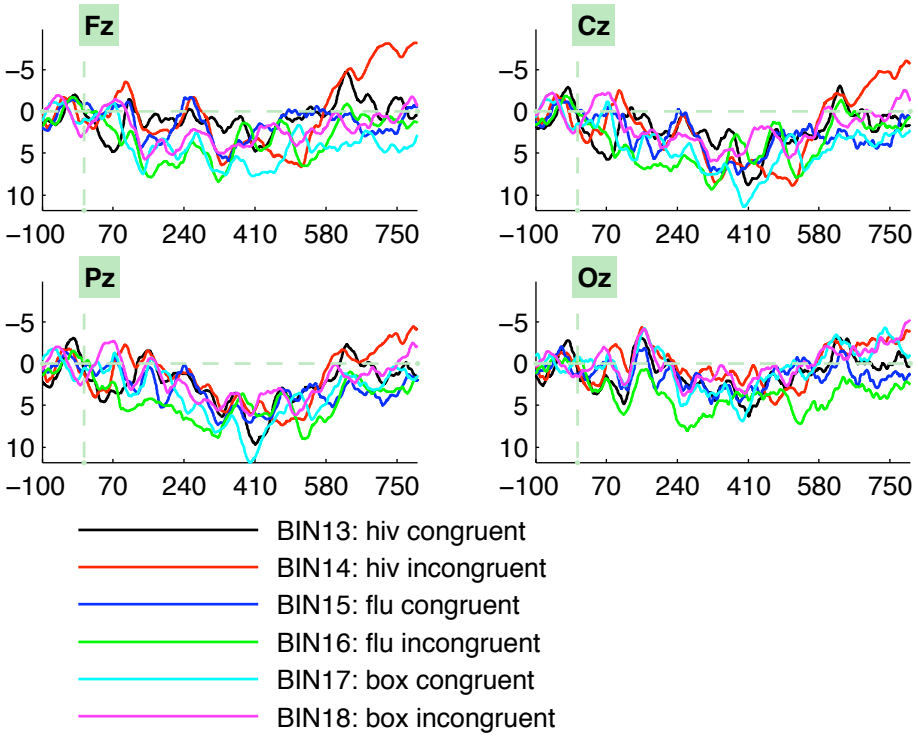

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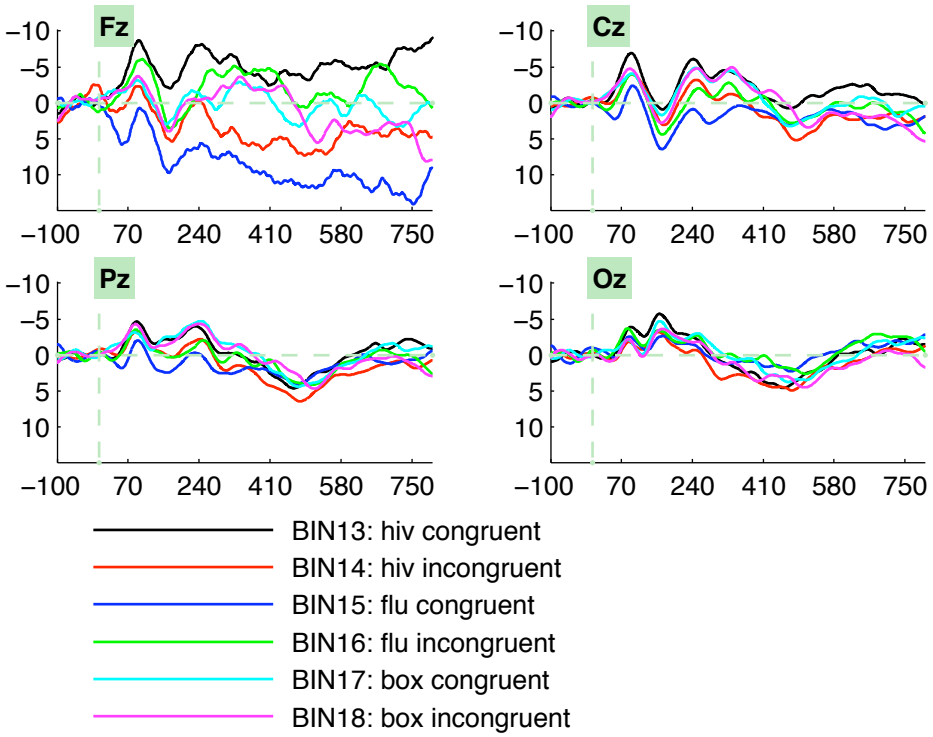

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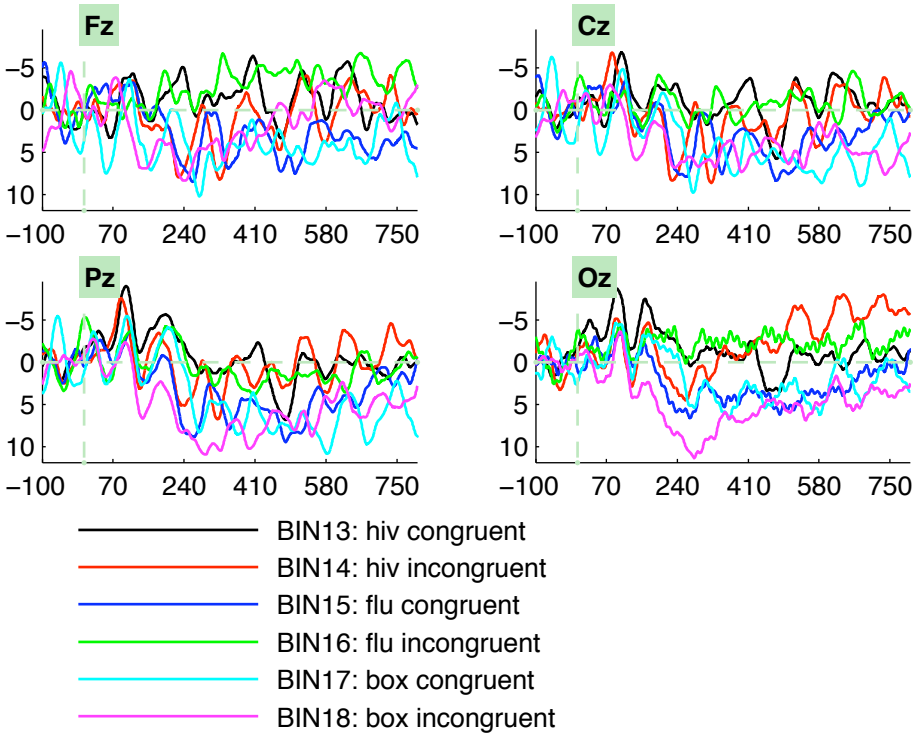

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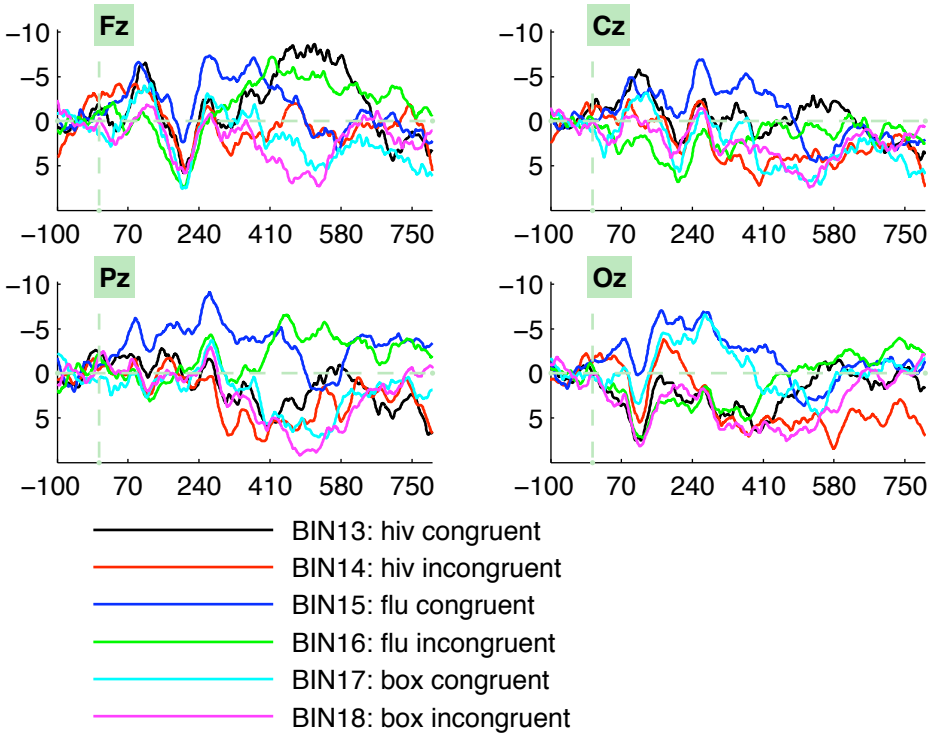

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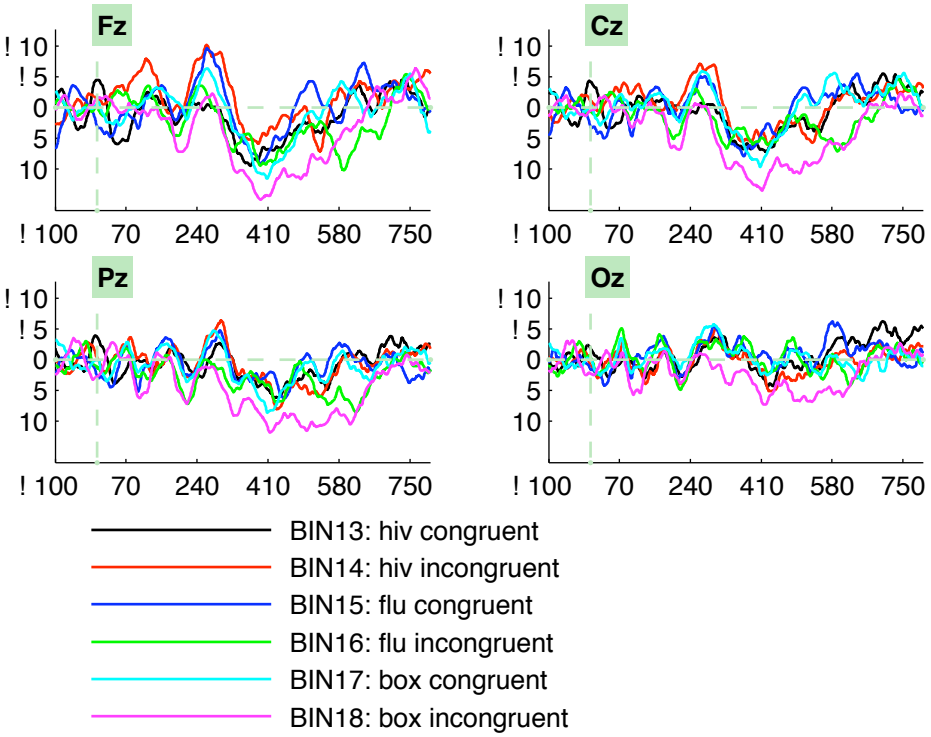

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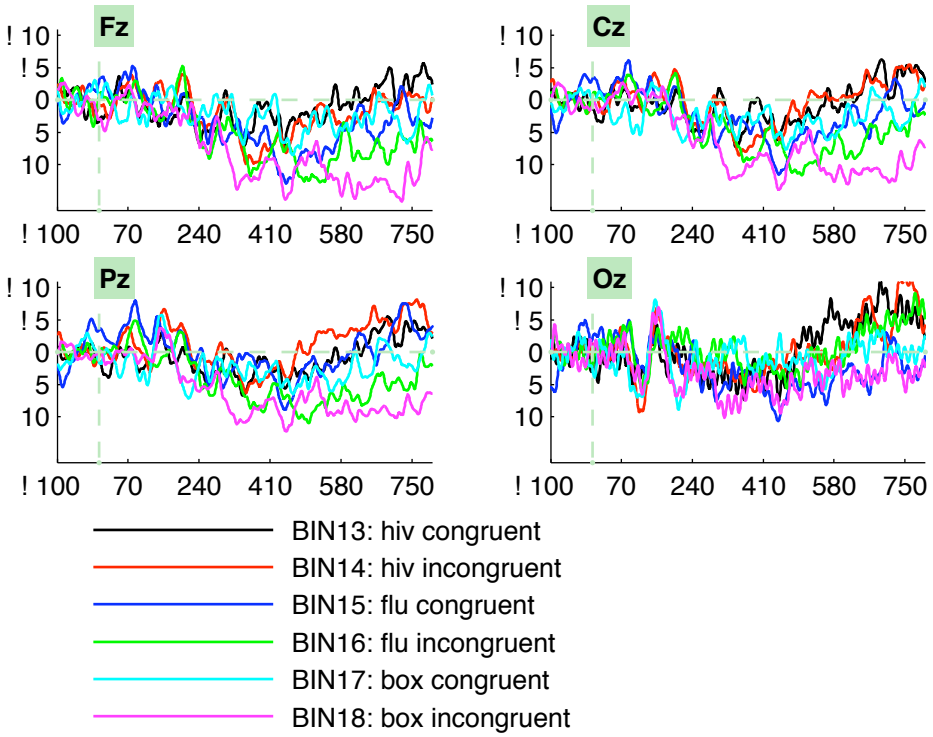

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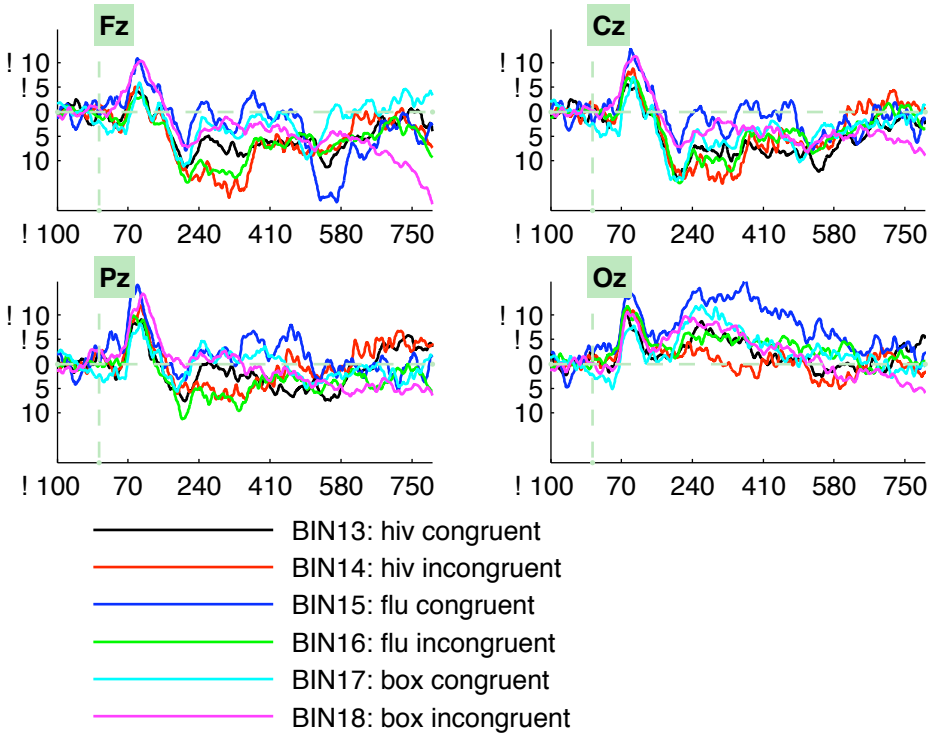

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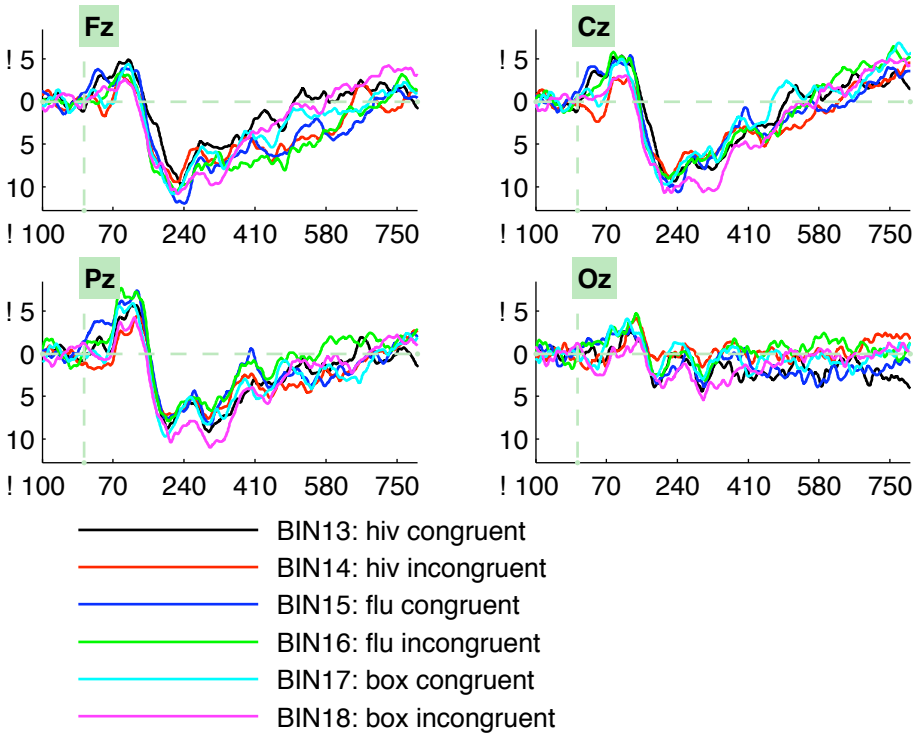

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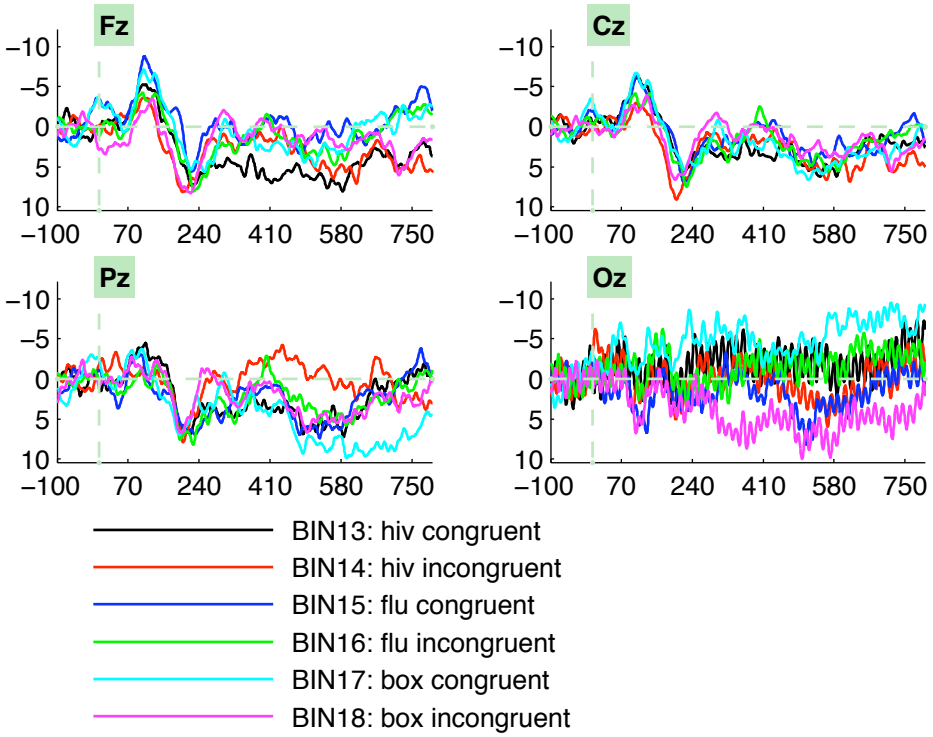

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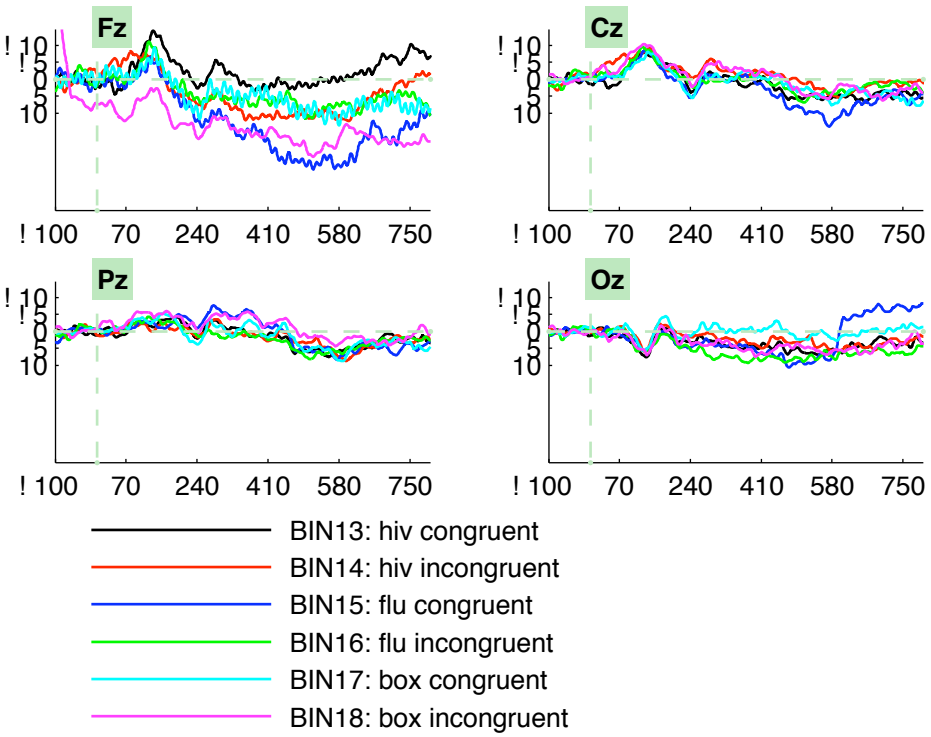

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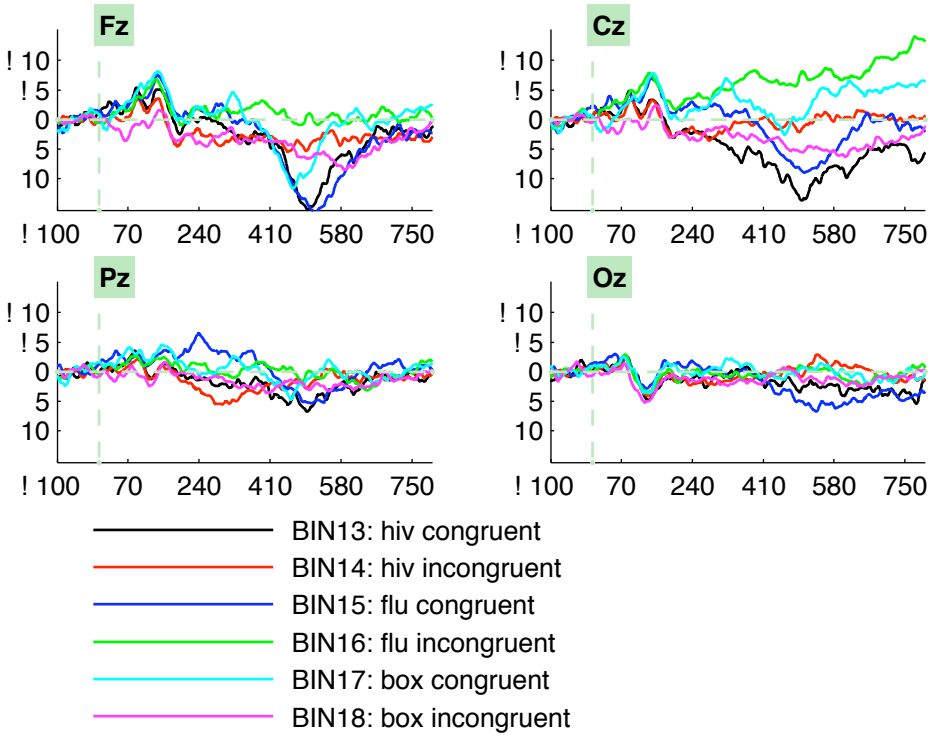

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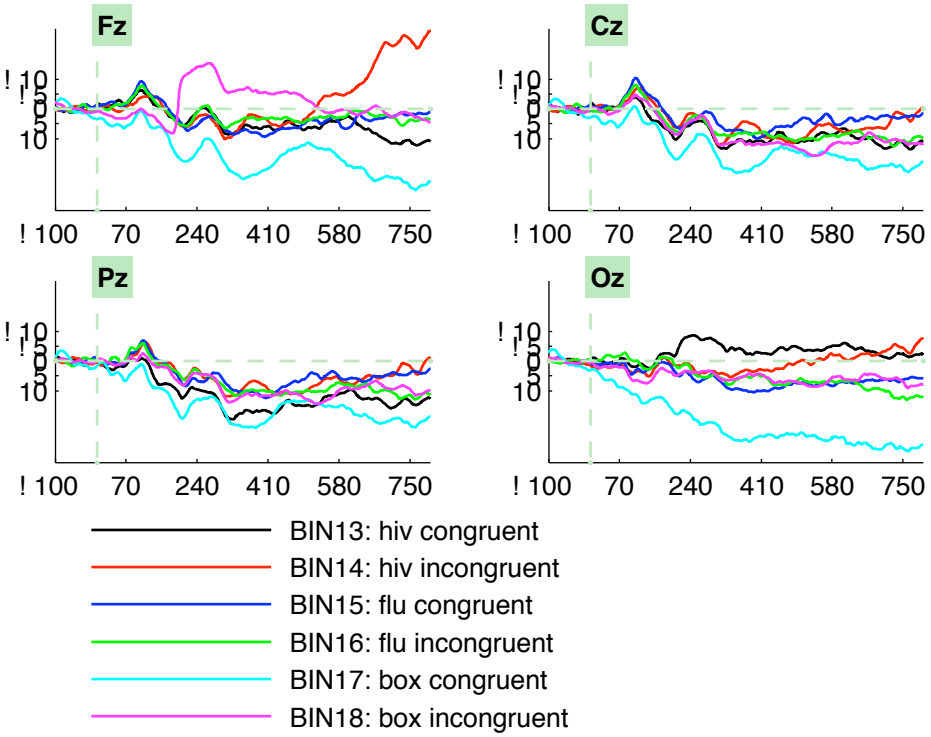

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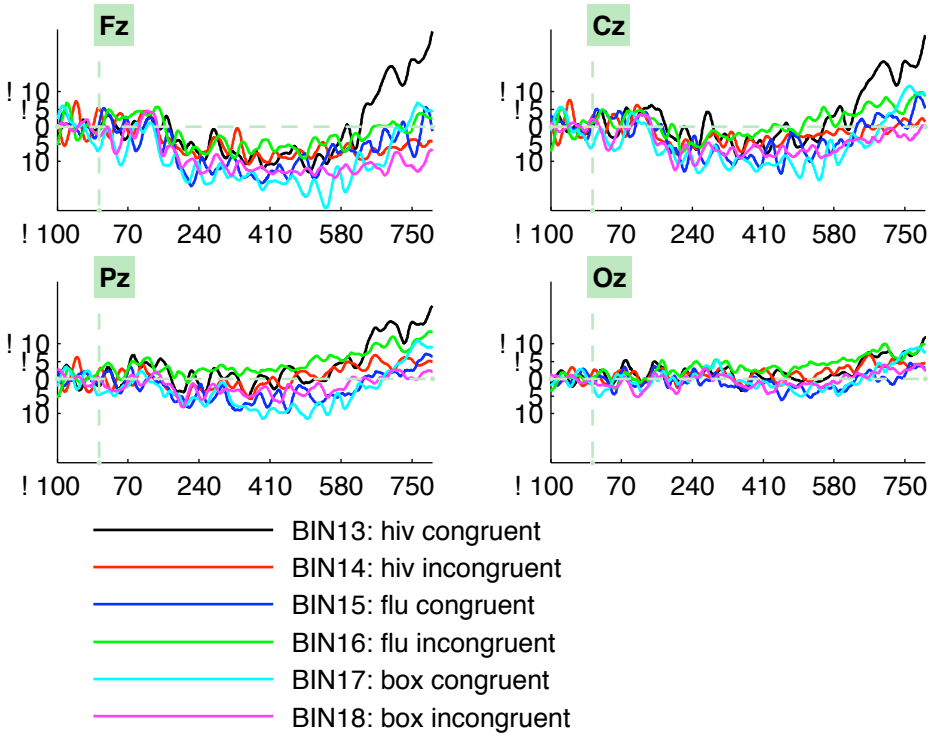

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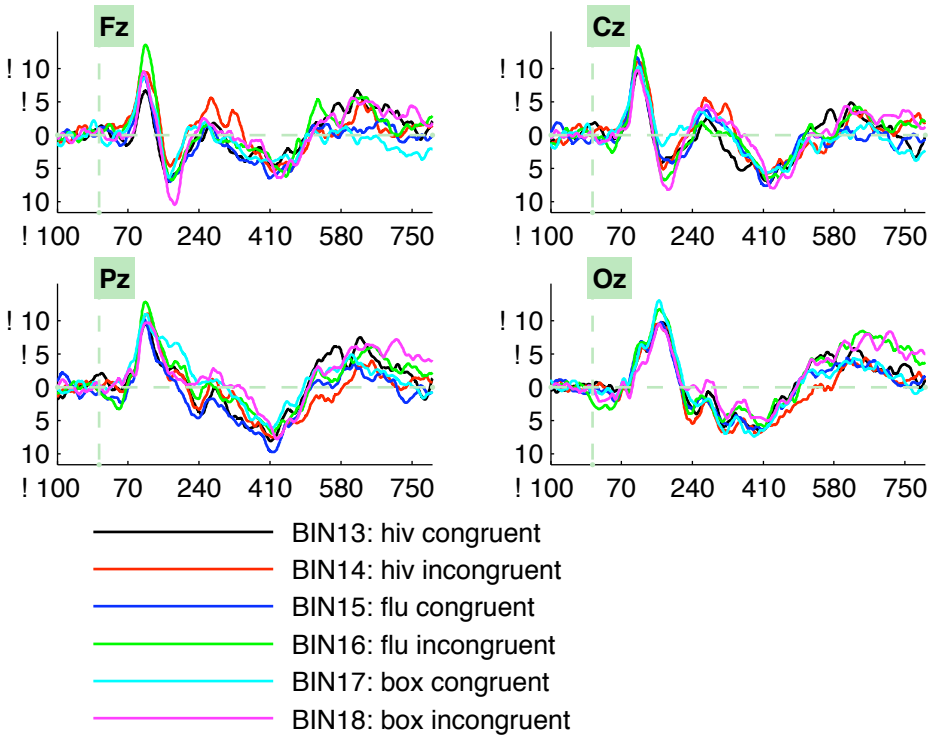

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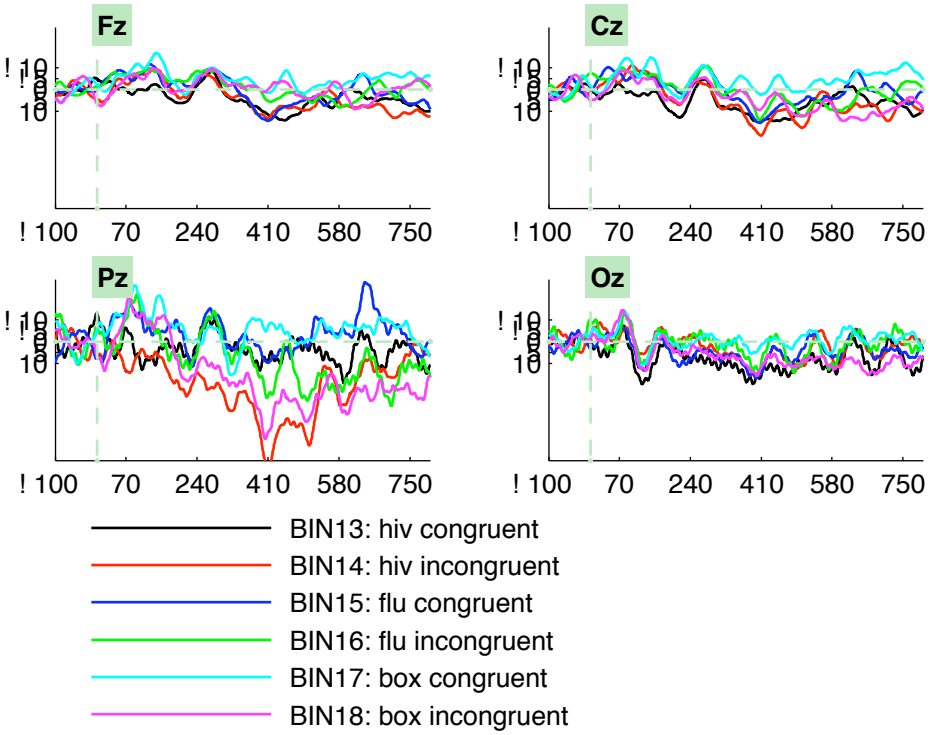

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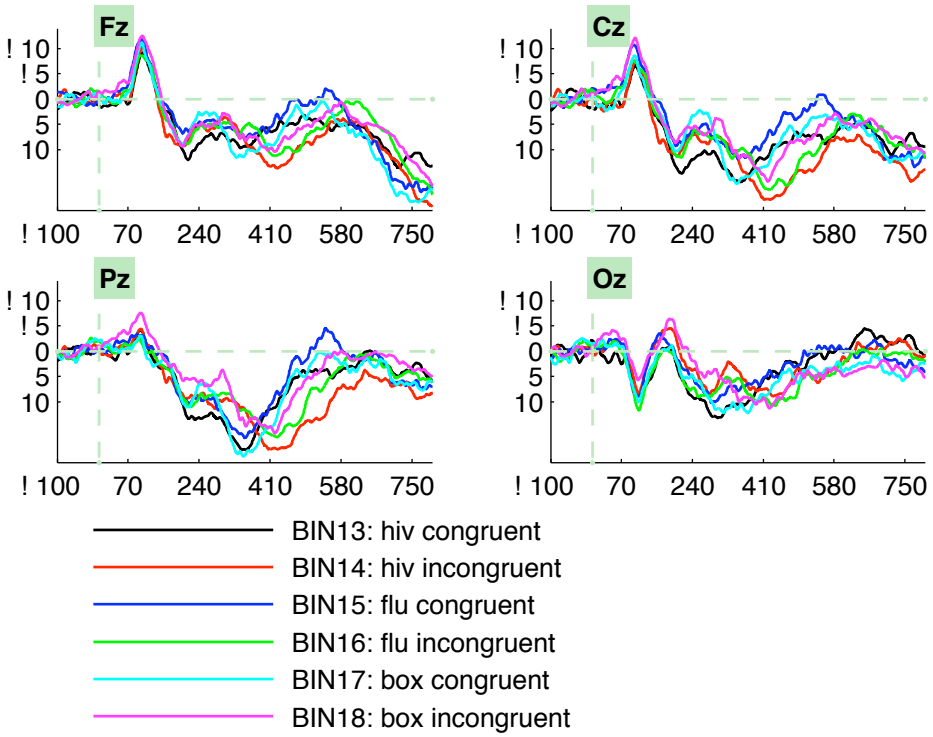

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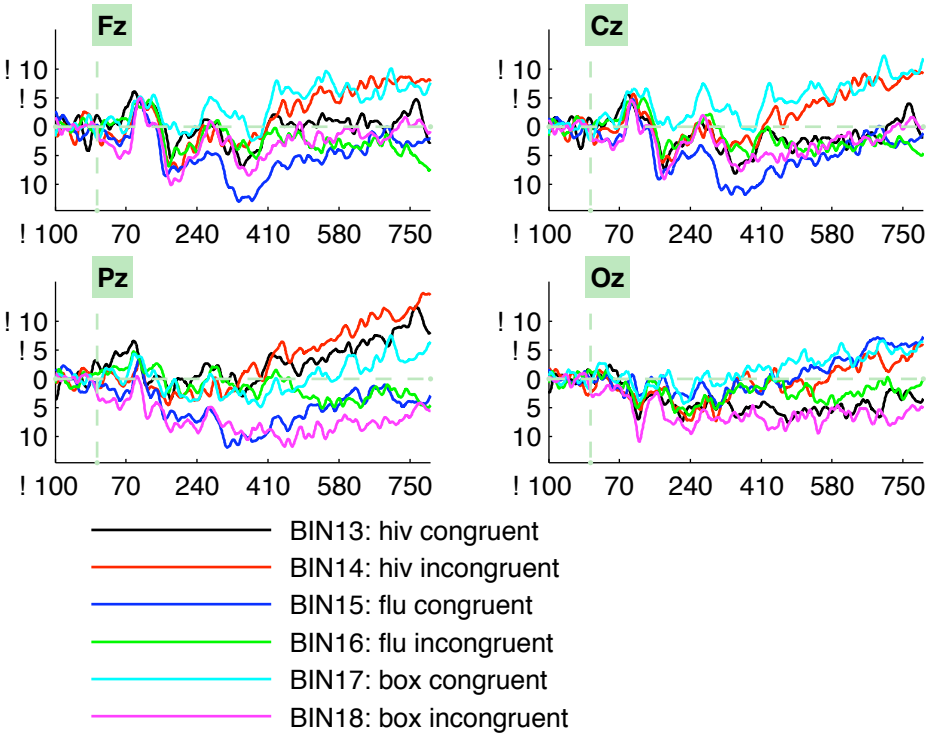

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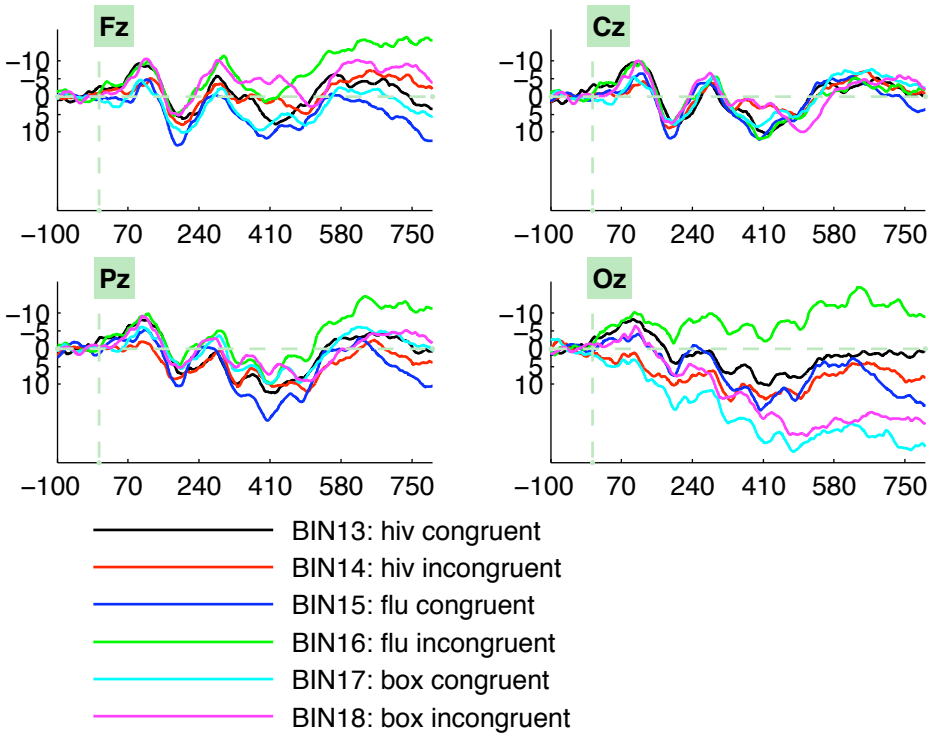

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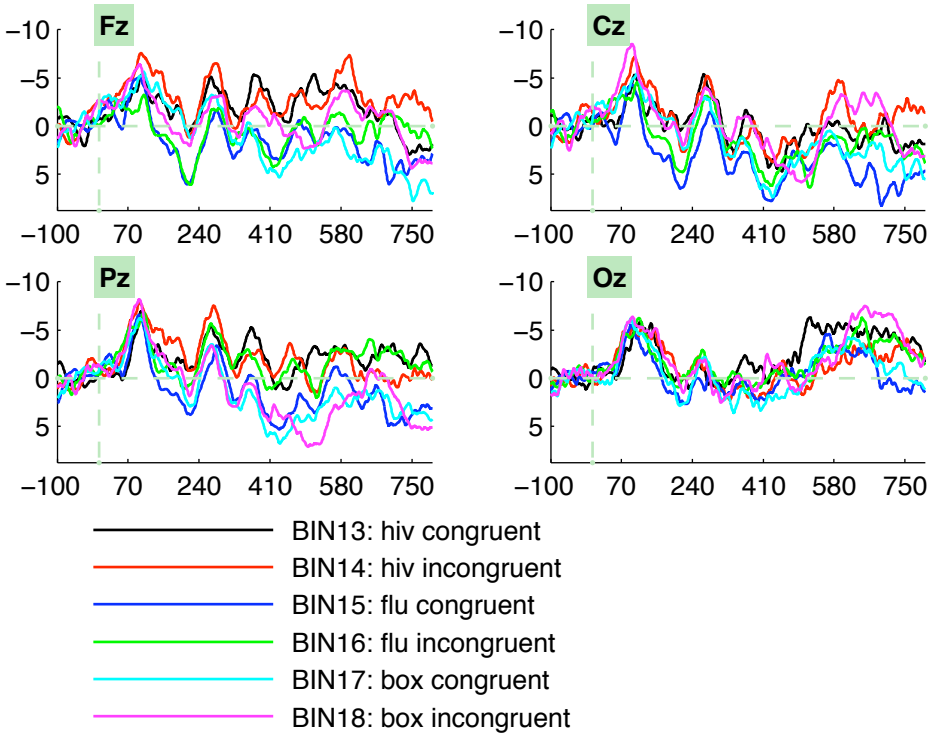

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